Paper
TRADE JOURNAL
PUBLISHED WEEKLY
FEBRUARY 16 1950

WOOD PULP

G

Established 1886

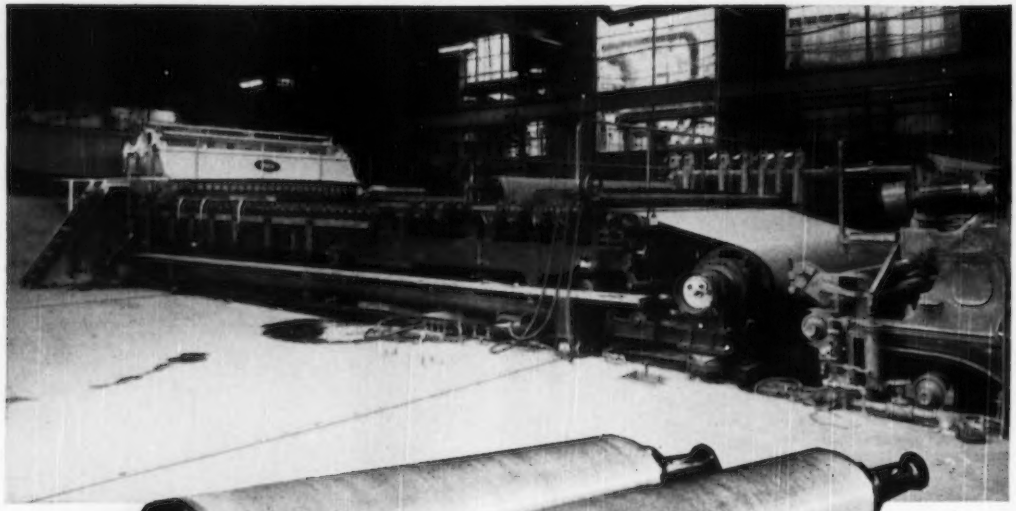
"The past is gone and static.
The future is before us and dynamic.
Each day brings with it new frontiers."
CHARLES F. KETTERING

America is—and always has been—dynamic.

The challenge of a steadily accelerating paper consumption the world around, coupled with the stream of ever new and wonderful pulp and paper products, assures a multitude of opportunities for the future.

Whatever your requirements in Bleached and Unbleached Softwood and Hardwood Sulphites, Sulphates, Soda and Groundwood, we should like to work with you.

GOTTESMAN & COMPANY
— INCORPORATED —
22 EAST 40th STREET • NEW YORK 16, N. Y.
EUROPEAN OFFICES: Birger Jarlsgatan 8, Stockholm, Sweden



Downingtown suction couch roll installed at the mill of P. H. GLATFELTER CO., Spring Grove, Pa.

Two Downingtown suction couch rolls ready for shipment and installation. Double suction boxes of these rolls combine the virtues of a wide, low vacuum box and a narrow, high vacuum box in ONE roll.

5 BIG ADVANTAGES of Suction Couch Rolls with Double Suction Box

A Suction Couch Roll with a double suction box is a Downingtown standard—no special construction is needed to give you these 5 BIG advantages: (1) Maximum water removal at the couch assures SAFER RUNNING thru presses at high speed. (2) Large suction area absorbs carry-overs from the flat boxes and helps PREVENT them from causing BREAKS. (3) VACUUM is applied GRADUALLY.... In many mills, where high vacuum is used in a single box, it has been found that fibres are drawn into the wire, thus hindering easy removal of the sheet from the couch and sometimes even causing picking. (4) A double box in one roll means that free air is NOT HANDLED TWICE, as it is when a combination of suction couches is used. (5) Minimum vacuum equipment and MAXIMUM WATER REMOVAL. The double suction box consists of one wide, low or moderate vacuum box and one narrow, high vacuum box. (6) Due to Downingtown roll construction, which permits a rear suction, the two box connections are made at front and rear. This eliminates the constriction of air passages which is necessitated when both connections must be made at the front.... This development is just one of many perfected by Downingtown engineers over the years. Write for information about our other suction rolls, too, including single suction box, cantilever suction couch rolls and suction press, drum, extractor, and cylinder couch rolls.

DOWNINGTOWN MANUFACTURING COMPANY

DOWNINGTOWN, PA.

DESIGNERS AND BUILDERS OF PAPER MAKING MACHINERY SINCE 1880

SAVE TIME!

Remove Rotating Element in 5 Minutes!

"PW" PAPER STOCK PUMP

Only 2 Steps

1. LIFT OUT BOLT ASSEMBLIES! Just loosen bolts and simply lift complete bolt assembly from slot. Nut, bolt and washers still connected for quick bolt reassembly. Maintenance downtime is cut to a minimum!

2. SWING OUT ROTATING ELEMENT . . . without effort! Disassemble in five minutes without disturbing suction or discharge piping. Only five main parts subject to wear . . . with each part quickly and easily accessible. "PW" pump can be *Texrope* V-belt or direct drive.

SINCE AUGUST, 1947, the "PW" pump above has been handling over 4% consistence at 2000 gpm in the beater room basement of the Wausau Paper Mill company, Brokaw, Wisconsin. "Only minimum maintenance has been required during this period," according to D. L. Calkins, plant engineer.

The "PW" pump is specifically designed with heavy-duty shaft and bearings to handle high consistence pulps. It pumps as high as 8% consistence when used with *Hi-Density* Feeder, a multiple vane assembly that moves pulp into pump suction.

Parts inventories can be cut as much as 70% because comparable size units of different ratings have interchangeable parts.

Available in eight sizes with capacity range from 175 to 10,000 gpm—heads to 140 ft. Iron, *Ni-Resist* alloy or stainless steel parts carried in stock. Special materials to suit abrasive or corrosive applications.

For more details, call your A-C Sales Office, or write for Bulletin 08B7112.

ALLIS-CHALMERS, 994A SO. 70 ST. MILWAUKEE, WIS.

A-2889

MOTORS

CENTRIFUGAL PUMPS

TEXROPE V-BELT DRIVES

ROTARY KILNS

HI-DENSITY FEEDER

STREAMBARKER

AND OTHER EQUIPMENT FOR PAPER MAKING . . .

Texrope, Hi-Density and *Streambarker* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

TO GET THIS:
Clean circulating systems without stopping production
JUST DO THIS:
Charge paper machines with TEXACO URSA OIL X**
as described below

Photo courtesy Beloit Iron Works

Here is the easiest, surest, and least expensive way to clean bearings and oil lines of circulating systems on paper machines. Replace a small percentage of the present oil with *Texaco Ursa Oil X*. It works fast and effectively to loosen accumulations of paper dust, carbon and water, carrying them down to filter or centrifuge for removal.**

When the circulating system is clean — oil flowing freely and fully to all bearings — continued use of *Texaco Ursa Oil X* will keep it clean. You have no further trouble or heavy clean-up expense . . . bearings will be fully lubricated and protected against rust even during shutdowns.**

Texaco Ursa Oil X is fully detergent and dispersive, and effectively resistant to foaming, oxidation, and sludging. It has an extra-long service life and is recommended by leading paper machine manufacturers.**

Let a Texaco Lubrication Engineer explain in detail how *Texaco Ursa Oil X* can help you maintain uninterrupted, full-speed operation and reduce your maintenance costs. Just call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.**

TEXACO

TEXACO Lubricants and Fuels

FOR THE PAPER INDUSTRY

TUNE IN . . . TEXACO presents MILTON BERLE on television every Tuesday night. METROPOLITAN OPERA radio broadcasts every Saturday afternoon

PUBLISHED
EVERY THURSDAY
by
LOCKWOOD
TRADE JOURNAL CO., INC.
15 West Forty-Seventh Street
New York 19, N. Y.
Phone: PLaza 7-2370

GEORGE E. LOCKWOOD
President and Treasurer
ARTHUR E. GORDON
Vice-President
FREDERICK E. WINKLER
Secretary

HENRY J. PERRY
Editor
R. E. THUEMMES
Managing Editor
E. P. McGINN
Industrial Editor
E. P. NUTTALL
Associate Editor
F. B. GROSSE
Production Manager

REPRESENTATIVES

Eastern
BRUCE E. BROWN
FRANKLYN H. OLSEN
15 West Forty-Seventh Street
New York 19, New York
Telephone: PLaza 7-2370

Mid-Western
H. K. VINTON
GEORGE HEITZEBERG
Room 1020
79 West Monroe Street
Chicago 3, Ill.
Phone CEntral 6-2784

Pacific Coast
McDONALD-THOMPSON
639 South Wilton Place
Los Angeles 5, Calif.
Phone: DUnkirk 7-2590
564 Market Street
San Francisco 4, Calif.
Phone: YUkon 6-0503
Terminal Sales Building
Seattle 1, Wash.
Phone: Main 3860
115 S.W. Fourth Ave.
Portland 4, Ore.
Phone: Atwater 7401

Western
McDONALD-THOMPSON
317 Railway Exchange Bldg.
Denver 2, Colo.
Phone: Main 2733

Southern
EDWARD M. BUCK
1025 National City Bldg.
Dallas 1, Texas
Riverside 1230

Subscriptions
Payable in advance.
Single Copy 15c
U. S. $5.00 per year
U. S. Possessions $7.00 per year
Canada $7.00 per year—Canadian Funds acceptable
Latin American Countries $15.00 per year
All Other Countries $20.00 per year

Paper TRADE JOURNAL

VOL. 130 FEBRUARY 16, 1950 NO. 7

FEATURES

	Page
Fowler Invites Celler	11
New Pulp And Paper Mill For Algeria	12
Paper Mill Air Compressor Operation	19
State Forest Products Research in Michigan	22
Fabricating Quality and Performance Into Corrugated Shipping Containers	26
Analysis of Pulp & Paper Industry and the Raw Material Supply	33
Kraft Bag Markings	44
N. E. Navigation And Power Plans	45

DEPARTMENTS

	Page		Page
Trends	7	Materials	43
News of the Week	11	Imports	43
Forestry	24	Navigation	45
Converters	28	New Equipment	45
Associations	30	New Literature	46
Suppliers	38	Production Ratio Report	48
Patent Abstracts	40	Obituaries	48
Financial Record	41	Classified Advertising	49
Prices	42	Index to Advertisers	58

DATES TO REMEMBER

FEBRUARY, 19-25: A.P.P.A., Waldorf-Astoria, New York City.

FEBRUARY 20-22: National Council for Stream Improvement, Waldorf-Astoria, New York City.

FEBRUARY 20-24: Technical Assn. of the Pulp & Paper Industry, Hotel Commodore, New York City.

FEBRUARY 21: Massachusetts Institute of Technology Alumni, Engineer's Club, 32 West 40th St., N. Y. C.

FEBRUARY 21: SAPI, Hotel Waldorf-Astoria, New York City.

FEBRUARY 22: N.Y.S. College of Forestry Alumni, Roosevelt Hotel, New York City.

FEBRUARY 22: University of Maine, Hotel Commodore, New York City.

FEBRUARY 23: A.P.P.A. Dinner, Annual Meeting, Waldorf-Astoria, New York City.

FEBRUARY 26-MARCH 1: American Institute of Chemical Engineers, Regional Meeting, Rice Hotel, Houston, Texas.

FEBRUARY 27-MARCH 3: American Society for Testing Materials, Committee Week & Spring Meeting, Hotel William Penn, Pittsburgh, Pa.

FEBRUARY 28-MARCH 1: National Marketing Conference, Chamber of Commerce of the U.S., Hotel Book-Cadillac, Detroit, Mich.

MARCH 13-15: National Assn. of Waste Material Dealers, Inc., Waldorf-Astoria, New York City.

MARCH 15-17: American Management Assn., Marketing Div., Hotel Statler, New York City.

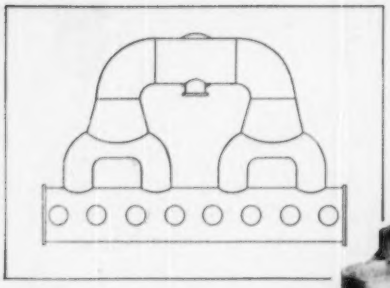
MARCH 22-23: Folding Paper Box Association of America, 1950 Carton Competition, Annual Meeting, Drake Hotel, Chicago, Ill.

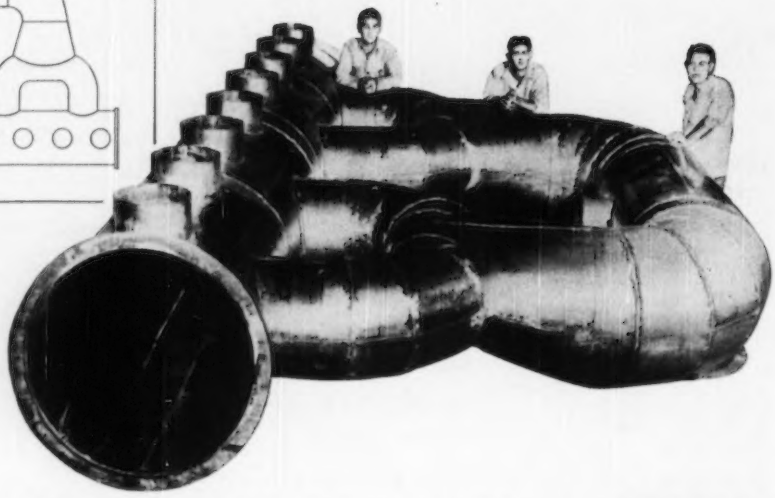
MARCH 27-29: National Paper Trade Assn., Hotel Waldorf-Astoria, New York City.

APRIL 25-27: 1950 American Newspaper Publishers Association, Hotel Waldorf-Astoria, New York, 22, N.Y.

JUNE 8-10: American Pulp & Paper Mill Superintendents Assn., Edgewater Beach Hotel, Chicago, Ill.

Entered as Second Class matter at the post office at East Stroudsburg, Pa., under Act of Congress of March 3, 1879. Publication Office at Lockwood Trade Journal Co., Inc., 34 N. Crystal St., East Stroudsburg, Pa. Printed in U.S.A. Copyright 1950 by Lockwood Trade Journal Co., Inc. PAPER established Feb. 17, 1892, combined with PAPER TRADE JOURNAL, Nov. 18, 1899. PAPER, established Sept. 21 1910, combined with PAPER TRADE JOURNAL, February 19, 1936. All rights to the above titles reserved. Contents of PAPER TRADE JOURNAL, including all articles, illustrations, etc., are copyrighted and may not be reprinted except by permission. PAPER TRADE JOURNAL is indexed in Industrial Arts Index and Engineering Index. Also publisher of LOCKWOOD'S Annual DIRECTORY OF THE PAPER AND ALLIED TRADES.





Header assembly for connecting paper machine fan pump to primary header in a large Southern paper mill. Ducts are 30" in diameter at widest points, and the assembly is more than 200" in overall length.

"35" Monel sheet, from .078" to .125" thick, was used throughout. The satin smooth finish forms the interior surfaces . . . stays smooth . . . never gives slime and fibre a chance to dig in.

The header assembly was fabricated by W. L. RIVES CO., INC., 87 Riverside Viaduct, Jacksonville 4, Florida.

Rustproof, easy-to-form MONEL simplifies tough stock-line jobs!

In the header assembly pictured above, *workability* as well as resistance to slime and corrosion were the important considerations in selecting a metal for the job.

The fabricator—W. L. Rives Co., Inc. of Jacksonville, Florida—and the paper mill engineers agreed on *Monel**, thereby minimizing fabrication problems and insuring important economies for the paper mill.

Monel's ready workability keeps fabricating costs low. And Monel's high strength makes possible the use of light-gauge metal. In addition to savings on material costs, the lighter-weight assemblies are less costly to ship and easier to install.

More important still . . . Monel's exceptional resistance to corrosion and sliming promises important savings for years to come because of lower upkeep and replacement expense.

For these reasons—corrosion-resistance, workability, high strength—Monel has long been recommended by many of the nation's leading fabricators and machine builders . . . for head boxes, doctor blades, screens, save-alls, jordan bars, winding wire, rolls, and roll covers.

If you are looking for mill equipment that will give long trouble-free, economical service, write today for the address of your nearest fabricator specializing in Monel and other long-wearing Inco Nickel alloys.

Remember, too . . . we always welcome an opportunity to help you solve corrosion and metal fabrication problems. *Reg. U. S. Pat. Off.

EMBLEM OF SERVICE INCO TRADE MARK

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall St., New York 5, N. Y.

MONEL*... for Minimum Maintenance

Paper TRADE JOURNAL

TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, February 15, 1950

More Rag Contents Rise

Most of the major producers of rag content papers have now announced price rises which range from ¾ cent to 1 cent on 25 percent's; from 1 to 1.3 cents on 50 percent; 1½ to 2 cents on 75 percent; 2 to 2½ on 100 percent's. Differential of 1 cent is being maintained between 16- and 20-lb. basis.

Explanation for the rises is pretty generally stated as increased costs of raw materials.

Because the changes have been popping almost daily, distributor resale prices have not all been refigured. *Prices* page must of necessity be incomplete temporarily.

Mill representatives report demand heavy with some inventory building in process. New England's mills, in many instances, are running four days a week. Competitive selling holds some underpricing, dealers state.

Wrapping Tissues Ease

Easing of supply in wrapping tissues has heightened competitive selling at the distributor level and introduced some new prices, details of which are reported in *Prices*.

In No. 1 Frd., the $1.40 price introduces a competitive range. In No. 1 MG, the $1.40 price quite generally reflects a 10 cent drop. The range in No. 1½ has moved down 5 cents from $1.35/1.40. Price differential in No. 2 has narrowed from $1.10/1.20 to $1.10/1.15. Kraft non-tarnish is lower by 12½ cents a ream.

Demand fell off seasonally after Christmas buying but continues at a good level. An element of caution anent the immediate future for non-durables serves as a check against inventory accumulation, it is said within the trade.

Notable Strength in Wood Pulps

Two facts for consideration when studying the 11 percent gain in wood pulp inventories at paper and board mills as of December 31—see Table—are (1) that the gain reflects year-end shutdowns; (2) that the gains follow the year's consumption pattern and are not evenly distributed by grades.

Among the sulfates, both bleached and unbleached gained but slightly, also true of soda and groundwood. A fair-sized gain showed up in sulfites.

Heavy January demand and delayed European arrivals caused further inventory withdrawals; and spots of short supply of bleached sulfates have been reported frequently.

Neither is there any assurance that easing of this condition is immediately in sight for bleached sulfates. Swedish and Finnish agents report their mills either sold out or so close to it that they have to check before accepting an order. The Scandinavian supply situation has altered considerably since last Fall, it is stated. Large pulp inventories are no longer in existence in either Sweden or Finland.

Sweden Raises Paper Prices

Effective February 5, Sweden lifted the export prices of papers to approximately where they were prior to last July's reductions.

Stockholm report of February 6 gives the following details:

Kraft and sulfite wrapping papers: in rolls, increased £3/10; in sheets, increased £4/10.

Glassines, rolls: increased £5.

Greaseproofs, rolls: increased £3/10.

Plain writing and printing: increases vary from 2 to £8/—all in metric tons, shipments c.i.f. ports.

Materials

Chlorine: Continues in heavy demand from paper mills with supply on the tight side.

Casein: Market strengthens slightly as Argentine season wanes. Price cases then firms at earlier levels.

Rosin: Trading light with inquiry fair. Prices sharply reduced during week. Supply in open market reported as limited. Producers continue to press Washington for higher support level, and will appeal to the President.

A quantity of gum rosin was made available from the producers' pool with CCC approval. Grades N through G are priced at $7.01 at port storage locations.

Rosin Size: Prices follow rosin market downwards.

Starch, Potato: Maine product in ample supply. Price eases to 4½ cents then firms at 4¾. Idaho pegged at 5 cents.

Salt Cake: Quoted at $22 c.l. works with varying transportation allowances. Reports of lower prices are not confirmed, though a competitive market is said to exist.

Waste Paper Market

Depressing effect of the winter's open weather is reflected in lowered prices for *mixed, news, old corrugateds*, and other bulky grades.

With the exception of Milwaukee, where the MCWPP reports *old corrugateds* inadequate to demand, an adequate-to-plentiful supply exists in all these grades in major markets. An over-supply exists in New York.

As the result of the cooperation between the Paper Shipping Sack Manufacturers Assn. and the National Assn. of Waste Materials Dealers, it is expected that the supply and quality of used kraft bags will gain materially. The program for marking ANK — all natural kraft — on multiwalls suitable for repulping will remove the hazard of asphalt, and wet-strengths, which has plagued both mills and packers.

Production Indexes

Ratio of production of unbleached kraft paper to potential mill capacity for that product was 96.2 percent for the week ended February 4, compared with 91.1 percent for the preceding week, and with 87.5 percent for the corresponding week of 1949.

Comparative ratios of U. S. paper and paperboard production to mill capacity, as reported by AP&PA, are:

	Feb. 4 1950	Jan. 28 1950	Feb. 5 1949	Feb. 7 1948	Feb. 8 1947
Paper	99.9	99.4	93.1	99.2	106.2
Paperboard	91.0	92.0	87.0	100.0	104.0

‡ Revised.

Paperboard Production (Tons)*

	Feb. 4 1950	Jan. 28 1950	Feb. 5 1949
Production	202,942	208,433	180,379
New Orders	248,603‡	178,896	220,321
Unfilled Orders	383,173	337,785	343,983

* Source: NPA.

General Business Indexes

Index of general business activity for the week ended February 4 eased to 150.4 from 153.6 in the preceding week, compared with 150.8 in the corresponding week of 1949.

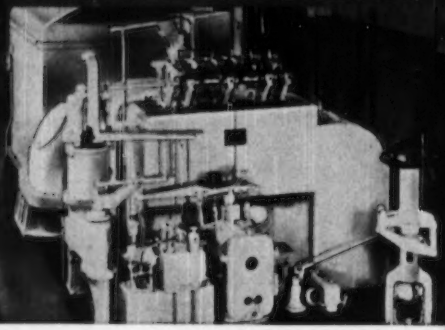
WOOD PULP: U. S. PRODUCTION, CONSUMPTION, INVENTORIES, DECEMBER, 1949

(Tons of 2,000 pounds)

Grade	U. S. Production Tons	% of Base	Consumption in paper & board manuf.	End of Month Inventories: At pulp mills, for later sale	At paper & bd. mills Dec.	At paper & bd. mills Nov.
Totals	1,071,315		1,215,189	32,801	413,074	372,231
Sulfite, Total	220,140	79.4	264,820		225,184	196,845
Bkd. Total	162,086		168,324	20,132	102,962	87,648
Dissolving & sp. chem.						
Softwood paper grds.	154,014		158,533		99,884	84,573
Hardwood paper grds.	8,072		9,791		3,078	3,075
Unbkd.	58,354		96,496	3,667	122,222	109,197
Sulfate, Total	520,172	85.1	596,546		131,732	125,194
Bkd.	92,742		127,245		61,882	59,729
Semi-bkd.	24,986		28,026		4,261	3,759
Unbkd.	402,444		441,275	2,505	65,569	61,656
Soda	42,564	84.6	47,619	284	13,294	12,432
Groundwood	167,945	74.4	186,138	374	33,915	31,386
All others	120,224	79.0	120,066	5,839	6,969	6,374

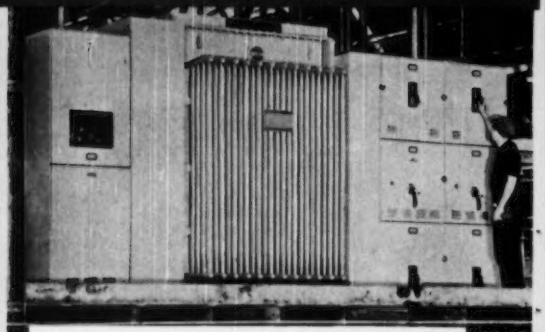
Based on Bureau of Census figures.

IN POWER GENERATION . . . .



G-E turbine-generators supply low-cost power as a by-product of process steam. With few wearing parts, they are easily maintained, give reliable service. Shown here is a G-E 3500-kw double-extraction condensing turbine-generator together with top-mounted air-cooler.

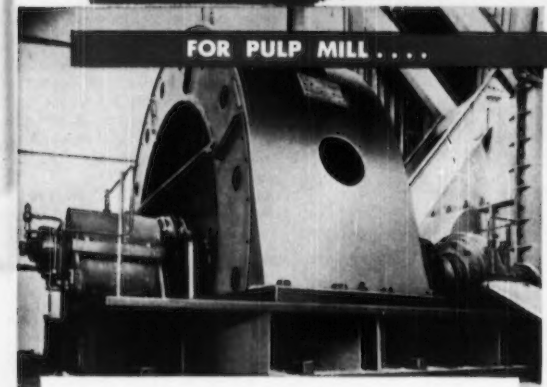
DISTRIBUTION . . . .



Reliability plus flexibility for growth are provided by G-E load-center unit substations, as with the 1000-kva unit shown in the photograph above. Team up these substations with G-E metal-clad switchgear and with tough, long-lasting G-E cable for maximum service continuity.

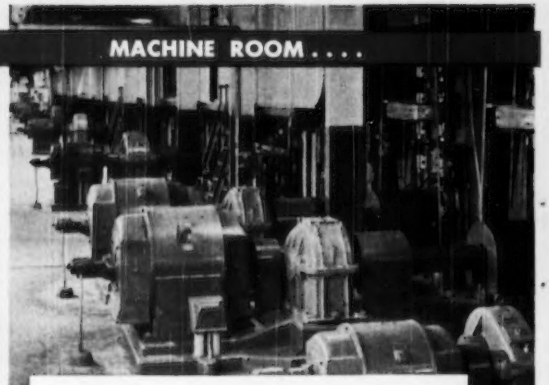
Where do you need PAPER-MAKING

FOR PULP MILL . . . .



This G-E synchronous motor, rated 1500 hp, drives a wood chipper. In addition to maintaining constant speed for high production, these high-efficiency low-cost G-E motors will improve your mill's power factor. They are available in high-speed and low-speed types in your required rating.

MACHINE ROOM . . . .



With a G-E multiple-generator sectional drive (above), draw is held accurately regardless of load changes, and precision control permits higher speeds, greater output. G-E paper-machine drives, in addition, include every other type made—single-motor, turbine, wet-end helper, and many more.

Centralized control with built-in short-circuit protection is provided for high-voltage motors by G-E Limitamp controllers (as with those above for Jordan drives). G-E Cabinetrol equipment provides compact, centralized control for low-voltage motors, protects personnel.

to cut costs?

G-E all-electric supercalender drives, tailored to your needs, hold desired tension at all times. Here stack, unwind, and windup units are all electrically driven. Also available are G-E winder drives that provide accurate control of speed and tension for fast, even-density winding.

General Electric equipment and industry specialists can help you do a faster, uniform-quality job!

What's *your* particular electrical need? Generating equipment that provides more power per fuel dollar? Or new distribution facilities that offer greater protection to your personnel and machines? Are you planning to speed production and cut costs with modern electric drives—for wood and stock preparation, paper-machine operation, or final finishing processes?

Whatever it is in electric equipment, General Electric can furnish it in just the type and size to meet your needs—whether it's only a small motor or control, or all the major electric equipment for your paper mill.

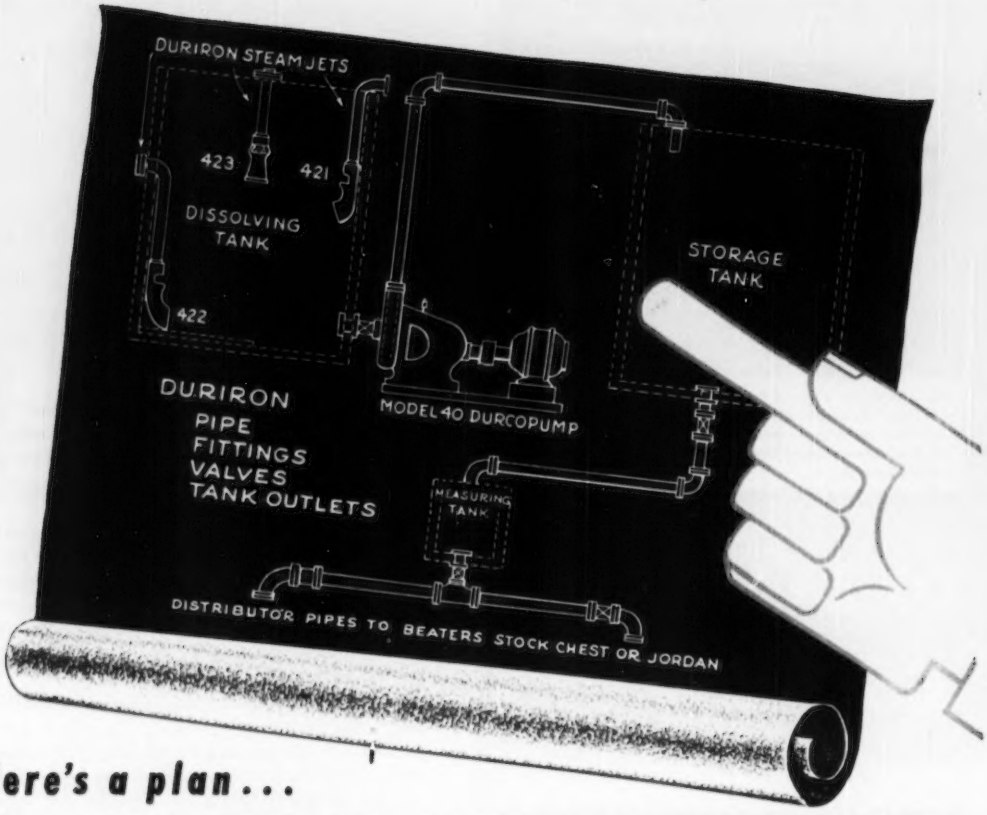
No job's too small, no job's too large. And every job benefits from the careful attention of G-E industry specialists. These men, familiar with the electrical problems in your industry, are skilled in assisting in the selection of the right equipment for your individual requirements.

And here's a big plus—a way you can save yourself time and trouble in modernizing or expanding any mill process. Let General Electric apply its Project-Coordination Plan to assist in selection of equipment, and to provide unified control of manufacture and shipment *to meet construction schedules.* Moreover, General Electric helps you in this way to minimize the endless planning and engineering details of "piecemeal" buying.

An efficient, smooth-working installation assures you faster, lower-cost paper-making. If you are considering mill modernization or expansion, the first step towards your goal is an immediate contact with your G-E specialist in paper-mill electrification. Call on him now—*today! Apparatus Dept., General Electric Co., Schenectady, N. Y.*

GENERAL ELECTRIC

655-4



Here's a plan . . .

TO CUT CORROSION COSTS IN HANDLING ALUM

This drawing shows you where Durco's Duriron equipment guards an alum-handling system against corrosion.

Duriron is an alloy which has proved itself immune to alum's corrosive attack. The equipment, self-protected by the very alloy of which it is made, stays intact and efficient year after year. Furthermore, there is no danger of contamination to affect the color of the paper.

Duriron equipment installed to handle alum twenty years ago is still in service today.

Wherever corrosive solutions are used, Durco equipment and Durco special castings give you a sure and lasting way to handle them. Durco builds equipment in specialized corrosion-resistant alloys to fit each type of service. Here is a brief list of corrosive services and the Durco alloys which successfully withstand them.

Alum — DURIRON · Black Liquor — DURIMET 20 · Bleach — DURICHLOR · Caustic Soda—DURIMET 20 · Water Chlorination—DURICHLOR · Sulfurous Acid—DURIMET 20 · Panzyl Strainers—DURIMET 20 · Digesting and Recirculating Systems—DURIMET 20 or DURCO 18-8 SMo

Write for further information on Durco alloys and equipment. For details on the equipment shown ask for the bulletins listed.

DURCO
CORROSION RESISTING ALLOYS & EQUIPMENT

THE DURIRON COMPANY, INC., DAYTON 1, OHIO

Branch Offices in Principal Cities

Durco Adv. 108-GM

Model 40 Durcopumps. Capacities up to 2,000 GPM; heads as high as 230 feet. Bulletins 815 and 816.

Ball and Spigot — Bulletin 703.

Split Flanged —Bulletin 704.

Durco Pipe & Fittings. Sizes 1½" to 8".

Durco Plug Valves — Bulletin 636, 637, 638, 640.

Durco Y Valves —Bulletin 615 and 665.

Durco Steam Jets—Bulletin 1804.

Durco Tank Outlets—Bulletin 1810.

News of the Week

Fowler Invites Celler

R. M. FOWLER

February 8, 1950

Representative Emanuel Celler,
Chairman, Judiciary Committee,
House of Representatives,
Washington, D. C.

Dear Congressman Celler:

I have seen in the press your recent announcement that the Judiciary Committee of the House of Representatives, of which you are Chairman, intends to enquire into the supply of newsprint for United States consumers with particular reference to supply from Canadian mills. These reports have quoted you as emphasizing the importance of Canadian newsprint to United States consumers and the corresponding importance of the United States market to Canadian producers, with all of which any informed person would agree. There are, however, other parts of your statement, as reported which indicate that you have been given erroneous information.

In recent years there have been several Congressional committees interested in the subject of newsprint for consumption within the United States, and their procedures and experience may be of some value to your committee. One such enquiry was conducted by a Committee of the House of Representatives under the chairmanship of Congressman Boren. This Committee made a tour of newsprint mills in Canada, had discussions with Canadian producers, and carried out a comprehensive first-hand study of newsprint operations in this country, in the process of which our Association staff assisted to the best of its ability. A later enquiry in 1947 was conducted by another Committee of the House of Representatives under the chairmanship of Congressman Brown. This Committee visited various newsprint mills in Ontario and held meetings in Toronto at which Committee members had extensive discussions with Canadian manufacturers. In this instance, again, our Association staff co-operated in compiling data and explanatory material.

I believe that any members of these two Congressional Committees would confirm to you my impression that these visits to Canada proved to be the most useful form of enquiry and study which they could have had and, on our side, the representatives of the Canadian industry were glad to take part in the full discussions which the visits made possible.

It seems to me that your Committee similarly might find this procedure its most effective and useful form of obtaining information about the Canadian newsprint industry and I take pleasure, therefore, in inviting your Committee to come to Canada to obtain any and all facts concerning Canadian newsprint operations. We have extensive information covering capacity production, supply and distribution of newsprint in the Newsprint Association of Canada which would be submitted to you and you would have the same opportunities as were available to the Boren and Brown Committee for first-hand enquiry and discussion with Canadian newsprint manufacturers. I am sure that manufacturers will join with me in doing everything possible to make your visit an interesting and instructive one. Your Committee might also find it useful and interesting to visit a number of our Canadian mills, several of which are within easy reach of Montreal, and to inspect some of the woods operations in this area. I do not believe that it is feasible for your Committee to obtain a full and complete picture of Canadian newsprint operations without a first-hand study of this kind in Canada.

If you accept this invitation, as I hope you will, I would be glad to discuss arrangements as to the time and programme of your visit with any members of your Committee's staff whom you might care to name for this purpose. I have no doubt that our Department of External Affairs and your own State Department would look favorably on this procedure, but if there are any formalities in this connection which should be observed, I will be happy to co-operate with you and your associates in any way you may suggest.

This invitation is based on a belief that we, in Canada, should be willing to welcome you to our country and do all we can to make your study as full and useful as possible in this way. Newsprint is a commodity which, by its very nature, has certain explosive political characteristics and consequently has been a source of some friction and misunderstanding between our two countries from time to time. I am sure you will agree that, at a time of such international unrest as exists today, both we and you would be remiss in our joint responsibilities if we failed to co-operate in a reasonable way to establish accurate information and thus minimize the possibilities of misunderstandings which might damage the unique relationship that exists today between the economies of our two countries.

This letter should reach you on Thursday, February 9th, and for the information of the Canadian public, to whom newsprint affairs are of vital concern, I have in mind releasing it to the press on Friday afternoon. I mention this in case you would like to make a similar release in Washington.

I hope you will accept this invitation and will take it as conveying a Canadian attitude of goodwill and of friendly co-operation.

Yours sincerely,
(signed) R. M. Fowler
President, Newsprint Assn. of Canada.

New Laboratory For Soundview

EVERETT, Wash.—Howard S. Wright & Co., Inc., has been awarded a contract at an undisclosed figure by Soundview Pulp Co. for construction of a research and technical control laboratory at the firm's main plant site here.

New Pulp and Paper Mill For Algeria

In a little place with the name of Baba-Ali, not far from Algiers, a newly built pulp and paper factory was recently officially opened by the President of the French Republic. The factory is owned by the Compagnie Nord-Africaine de Cellulose S.A., created by Maurice Franck, the French industrialist well known in the paper world. The interior of this mill, and the smoothness of the process must be like a dream to a classic paper maker. But it is a reality: a fully continuous process from raw material to finished product!

The pulp plant was designed and supplied by the Cellulose Development Corp., Ltd., "Celdecor," England, and their associated company Celdecor Africa (Pty.) Ltd., in South Africa.

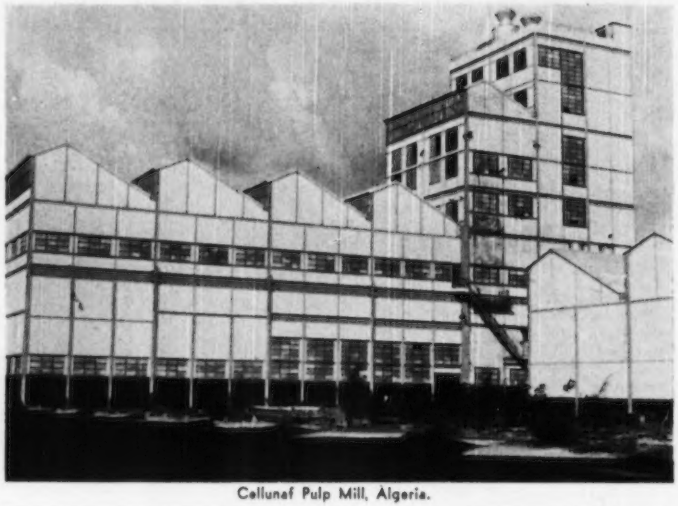
Two cutters prepare the straw and esparto grass for the continuous process, and after proper dusting and cleaning the raw material is blown to the top of the digestor-house, where a caustic solution impregnates the straw and grass. The two digestion towers are 80 feet high, which height was required in view of the increased temperature for digestion of esparto grass, i.e. 255-265° F.

As is well known, the main feature of the Celdecor-Pomilio digestion towers is that, although open at the top, they cause a gradual increase in temperature towards the bottom portion owing to the hydrostatic pressure. In the case of cereal straw — which can be fully digested with caustic soda at atmospheric pressure — the height of the tower can be only 20 to 25 feet. For bamboo and similar raw material, the required cooking temperature can be obtained very simply by increasing the height of the tower to 130-150 feet.

From the operational point of view it is interesting to note that all the heat required is supplied only by means of steam jackets, so that all the steam used is returned to the boilers as condensate, and there is no dilution of the liquor in the digestion tower, while the pulp travels down smoothly.

The mixture of straw and esparto grass is evenly and very well cooked by the time it reaches the bottom of the tower, from which it is continuously extracted, and pumped to the wash filters. The new type of liquid extraction adopted in this mill has proved to be most efficient, and the pulp is very well open for the subsequent wash.

The black liquor is washed out on especially designed Celdecor-Paxman vacuum filters. These filters were only introduced to the pulp industry about 5 years ago, when one was installed in the pilot plant of Celdecor. They pick up the pulp at any consistency up to 5 percent, and they deliver it nicely washed at up to 21 percent. This is extremely useful especially under circumstances like at Baba-Ali, where the mill had to be started up with a great percentage of unskilled labor. These filters just don't want any special attention, and literally run themselves. The Celdecor-Paxman filters have a suction drum which only dips into the pulp suspension for about 30 percent of its surface, so that the remaining 70 percent are available for displacement washing. Seven of these filters are in operation in the Cellunaf mill.



Cellunaf Pulp Mill, Algeria.

The Cellunaf pulp mill has two sections: one for fine bleached pulp, and one for semi-pulp, with a capacity of at least 24 and 18 tons of pulp per day respectively, to furnish the two paper machines, one producing fine grade papers, the other turning out cover and wrapping papers. The difference in treatment of the straw and grass for the two sections starts after digestion. The semi-pulp is considered for treatment after having passed only one wash-filter, while the pulp to be bleached is washed on two vacuum filters in series.

Following the usual lines of the Celdecor-Pomilio process for fine paper pulp, the digested raw material is chlorinated by means of chlorine gas coming straight from electrolytic cells. Previously the pulp is dewatered in two screw presses to about 30 percent consistency, opened up and fed to the gas chlorination tower, which consists of four stoneware pipes. The chlorinated pulp is extracted from these pipes in a similar way as applied to the digestion towers, and the pulp is given a further chlorination time at lower consistency in a retention tower. Next the pulp is washed and given a high density alkaline treatment, and finally bleached in two stages with hypochlorite in a Celdecor-Kamyr continuous bleaching plant.

The screening of the pulp is done in the unbleached stage by passing it over a flat screen, cyclonic sandtraps, and a series of rotary fine screens, which give a very clean pulp. The color of the bleached esparto grass pulp is white, not creamy like most of the esparto papers on the market. From the last vacuum filter the pulp is pumped direct to the paper mill storage chests.

At the semi-pulp side of the mill, the washed pulp is passed through a Bauer refiner, after which it is screened over a flat screen and subsequently thickened on two deckers.

The water required for both sections of the plant is recirculated as much as possible, and only the effluents from the first black liquor filter, the alkaline wash filter before screening, and from the first bleached pulp filter are wasted. Rejects from the fine pulp side are utilized in the semi-pulp plant. Per ton of bleached pulp about 300 tons of fresh water are used, and for the semi-pulp not more than 65 tons of water per ton of pulp are needed.

Looking for a Stainless Steel Plate as "big as the side of a house?"

THIS 3/8" PLATE IS 220-1/2" LONG, 133-3/8" WIDE. U·S·S 18-8 CB. (TYPE 347)

Come to Stainless Headquarters when your plate specifications call for sizes beyond the ordinary

● We show you this huge plate of Stainless Steel, ⅜" thick, 220½" long and 133⅜" wide, not because we consider it unusual but because there are still some plate users who are not fully aware that Stainless Steel plate in these extreme dimensions is readily available.

The fact is we have been producing such extra-large sizes for some time and can supply even larger if you need them.

So whenever your designs call for large dimension Stainless Steel plates to improve your equipment or to reduce welding costs and simplify fabrication, tell us what you need and give us an opportunity to show you how well we can meet your requirements.

Keep in mind too, that U·S·S Stainless Steel plates are produced in the complete range of standard sizes usually required by industry, in thickness from ¾" and greater, and are available in all U·S·S Stainless Steel grades.

In whatever size furnished, U·S·S Stainless Steel plates are distinguished for their superior surface quality. Chemical composition and physical properties are reliable. Our Stainless Steel specialists will be glad to cooperate with you in applying them to your construction to insure optimum results with minimum cost.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO · CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH & CHICAGO
COLUMBIA STEEL COMPANY, SAN FRANCISCO · NATIONAL TUBE COMPANY, PITTSBURGH · TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST · UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

U·S·S STAINLESS STEEL

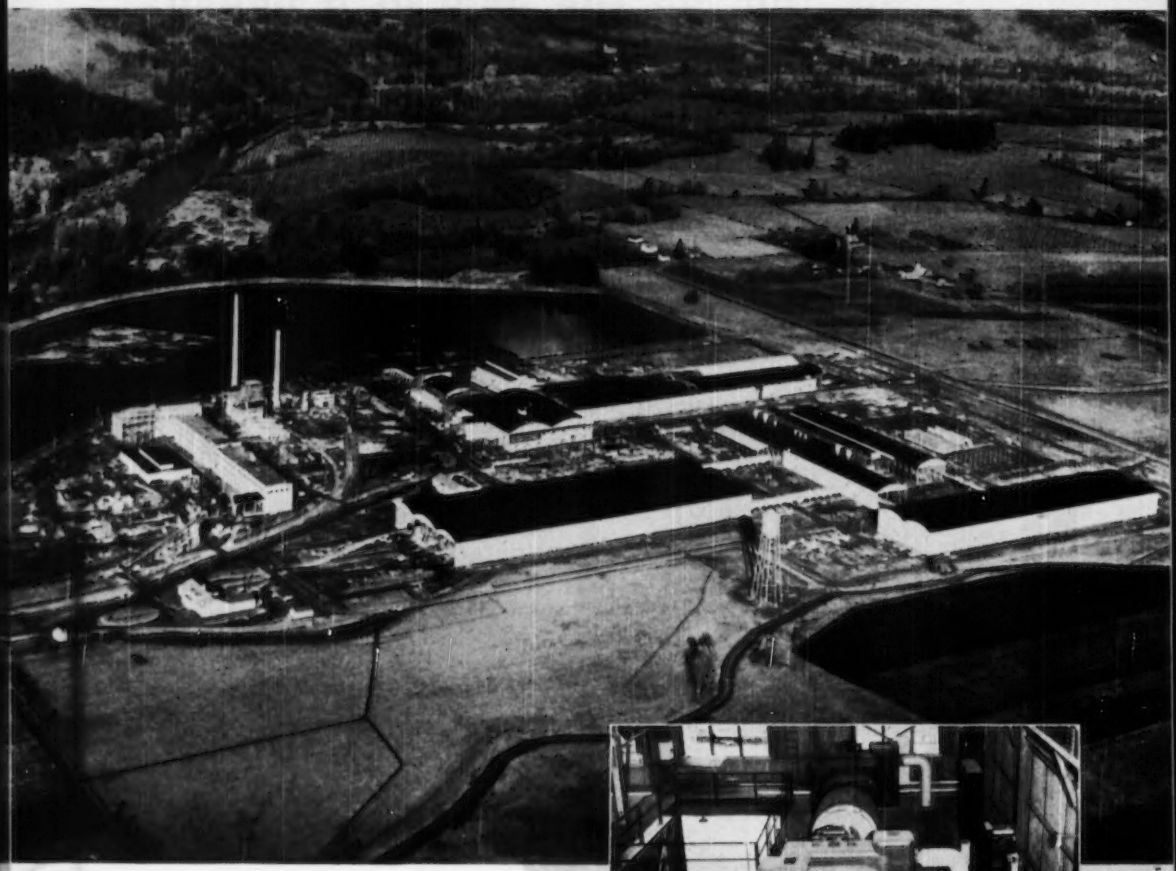
SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

O-311

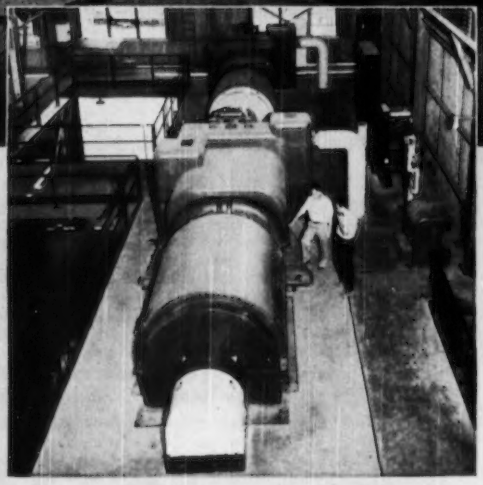
UNITED STATES STEEL

YOU CAN BE **SURE**.. IF IT'S

Westinghouse



TWO POWERHOUSE STACKS mark Weyerhaeuser's new Pulp and Paper Mill at Springfield, Oregon. Leftover scraps from the Weyerhaeuser lumber mill at right are converted into Kraft Paperboard. Lumber is fully utilized in this operation. So is power. Westinghouse Specialists helped co-ordinate the electrical apparatus into a plant that makes full use of every kilowatt generated.



POWER GENERATION . . . Starting point of Weyerhaeuser's electrical system in this modern powerhouse. These two Westinghouse 11,500-volt Turbogenerators supply three-phase power for both the paper mill and lumber mill operated in conjunction with it. In the foreground—a 9,375-kva unit; behind it—a 6,250-kva installation.

Westinghouse

EQUIPMENT FOR THE PAPER INDUSTRY

It's All Westinghouse at Springfield!

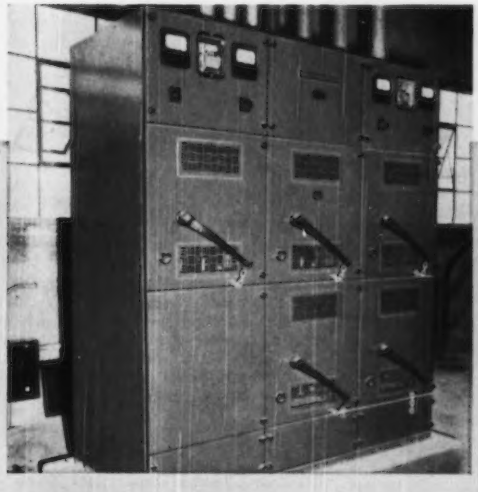
Handling the electrical requirements for a modern Pulp and Paper Mill is no small problem. There's a great deal of apparatus to buy, a lot of co-ordinating to do.

When Weyerhaeuser Timber Company planned a new mill at Springfield, Oregon, Westinghouse Paper Mill Specialists were called in for technical advice. Working with Weyerhaeuser's consulting engineers, Westinghouse helped co-ordinate the electrical apparatus. Result: knotty engineering problems and complex purchasing procedure were held to a practical minimum. And most important—a plant was built that generates power economically, distributes it safely, uses it efficiently.

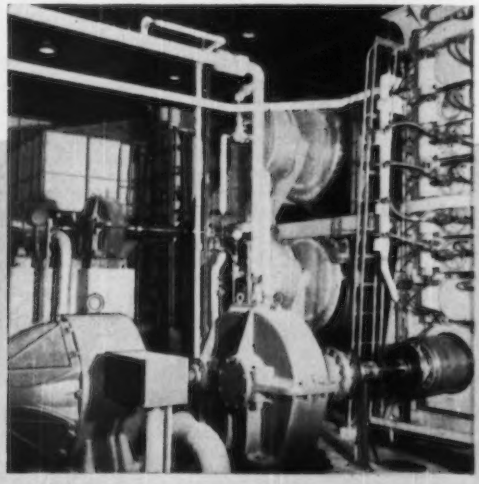
Apparatus to Meet YOUR Specific Needs

Westinghouse is geared to handle the electrical requirements for Pulp and Paper Mills. Apparatus is designed to meet the specific needs of your plant. After 30 years of close association with papermaking we know the problems and how to go about solving them.

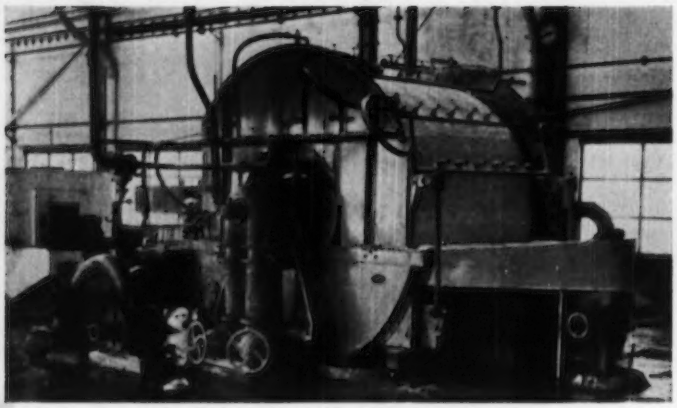
When you want experienced help on electrical equipment—for a new mill or your present plant—call your Westinghouse office or write: Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-94824



DISTRIBUTION . . . These three panels of air-breaker switchgear send power to motor control headquarters—the 440-volt Control Centers. All switchgear and controls are enclosed in metal-clad cubicles, protected against moisture and chemical fumes. Prime factor in design of the Distribution System: the need for continuity of service.



UTILIZATION . . . The mill's paper machine has a modern Sectional Motor Drive. Shown here—d-c motors driving the first and second calender stacks through Westinghouse Speed Reducers. Each motor is supplied by its own d-c generator. Hence, each section of the paper machine can be separately, accurately controlled.



One of the seven celdecor-pasman vacuum filters.

The chemicals for digestion, chlorination, and bleaching are supplied from a chemical factory nearby by means of direct pipelines. The power is obtained from imported fuel oil.

The supervision of the plant has proved to be extremely simple, and several parts of equipment are regulated by automatic devices. The paper section has no hollanders; only conical refiners. Addition of alum, size, etc., is also continuous. No further screening takes place in front of the paper machines. The equipment and machines for the paper making section were supplied from France.

To accommodate the staff imported from France, the company has built 20 charming villas on a hill near Algiers, overlooking the sea. Full amenities such as canteens, hygenic services, sports grounds, etc., have been provided at the mill for the Europeans and Arabs.

A new company, called Africalfa, entirely owned by Cellunaf, has been formed for the exploitation of a concession of 1,500,000 acres of esparto land. A good start has already been made in organizing the work on very modern lines, with a fleet of bulldozers, lorries, etc., and all social amenities for the Arab workers. This policy is showing good results, while most of the other esparto grass collectors, who unfortunately have for years exploited the Arabs more than exploited the esparto grass, have difficulties in finding labor. Africalfa have all the laborers they require, and they are approaching the stage where they will be able to sell esparto grass to other mills, in addition to what they require themselves.

The pulp plant of Cellunaf is a forerunner of a similar installation in India, which will work on bagasse. Three semi-pulp plants for cereal straw are under construction in France, not only for making from them wrappings, but also for the manufacture of newsprint after bleaching. A bleached-pulp plant based on straw is being erected in England, ordered after the very good experience by the same firm with a Celdecor-Pomilio continuous digestion unit erected during the war.

It is said that it has now been established that the Celdecor continuous process, using no elevated pressures, has proved to be highly successful where continuity in the production of high class materials is the object.

Strathmore Gets Safety Award

WEST SPRINGFIELD, Mass. — Among the group winners in the Industrial Accident Reduction Contest sponsored by the Hampden County Accident Prevention Council, listed as operating throughout the year without a lost-time accident, was Strathmore Paper Co.

Westfield River Names Frisbie

RUSSELL, Mass.—L. D. Frisbie, formerly general superintendent of the Westfield River Paper Co., Inc., with mills at Lee and Russell, Mass., and the Glassine Paper Co., with mills at West Conshohocken and Manayunk, Pa., has been elected vice-president in charge of manufacturing of all plants of the companies.

International's Gatineau Mill Fire

OTTAWA — An early morning fire which broke out in the Canadian International Paper Co. plant at Gatineau Mills near Ottawa caused an estimated damage in excess of $50,000 as well as forced an eight-hour shutdown of the entire mill. It is covered by insurance.

P. L. Thomas Represents Newton Mills

LONDON, England — Newton Mill, Ltd., have appointed P. L. Thomas & Co., New York, N. Y., as sole agents for New York and the Eastern Seaboard. They will handle the sale and distribution of Newton's complete line of gift stationery, papeteries, childrens' stationery and Christmas cards.

H. & W. Installs Dilts Machine

WATERVILLE, Maine—The Hollingsworth & Whitney Co. has recently installed at their Waterville, Maine Plant a new 84" Dilts Miami Lo-Type Waxing Machine.

Mechanically the machine is capable of sustained speeds in the order of 1500 FPM. It consists of a single shaft type unwind stand with Kohler running belt tension, a two roll waxing section with hot roll, a three roll waxing section, reversible to permit use of either the top nip or the bottom nip, a water finish attachment, a two roll cooling section, and a shaft type center winder. The waxing sections employ the squeeze roll principle of wax application and control. Loading and lifting of the top squeeze rolls is controlled through the use of air cylinders and Foxboro controls. Temperature control units are provided for maintaining uniform wax temperatures in the two wax baths. The drive for the machine is a Reliance multi-motor V-S unit with individual motors on each section driving to the sections through V-belts and sheaves. Through the use of an unwind drag generator at the unwind section operating in conjunction with Kohler running belt tension and a variable voltage DC motor at the rewind section either constant tension or tapered tension, absolutely uniform at all times, is possible insuring properly wound rolls. Stall tension also is provided for. In this equipment the customer will have the utmost obtainable up to the present in controlled uniformity of product and maximum flexibility of operation.

Sangamon Names Messner Vice-Pres.

CHICAGO—Samuel J. Cohen, president, Sangamon Paper Mills, Inc., has announced that Ollie W. Messner was elected vice-president of the firm on January 30. At that same meeting, according to the announcement, Timothy J. Russell was re-elected as assistant to the president.

Mr. Messner, president of The American Pulp and Paper Mill Superintendents Assn., Inc., for the year, 1948-49, went with Sangamon in the fall of 1949.

Smith Resigns From Central Paper

MUSKEGON, Mich. — Charles W. Smith, an official of the Central Paper Co. for the past 33 years, and president and general manager for the past 14 years, resigned his position as president and general manager, according to a January 28 announcement. The reason for his resignation is ill health, it was stated.

John G. Turnbull, a New York attorney and associated with the firm since 1934, will succeed Smith.

Gardner Changes Department Name

LOCKLAND, Ohio — The Gardner Board and Carton Co., recently announced that the name of the Folding Box Department at Lockland has been changed to the Retail Box Department.

B-I-E Program Successful

At Stevens Point, Wis., more than 350 educators were conducted on a city wide tour of 41 businesses and industries participating in a Business-Industry-Education Day Program.

The basic purpose of this event was to increase the teachers understanding of America's economic system, how it functions in business and industries and how they, the teachers, contribute to and depend upon its productivity. A. J. Schierl, general manager of the Whiting-Plover Paper Co., was chosen as chairman of the program which was sponsored by the Chamber of Commerce of that city.

The educators were from the public and parochial schools and the Central State Teachers College, including all practice teachers. The schools were closed at noon permitting the program to begin at 1:00. The teachers were escorted through the various business establishments after a kick-off meeting where the film "The Price of Freedom" was shown to the complete assembly.

As the groups of teachers arrived at the Whiting-Plover Paper Co. to make their visitations they were welcomed by Mr. Schierl in his office. During these meetings a brief history of the company was given the groups as well as an explanation of the company's policies, its manufacturing functions, its accounting practices and generally, as comprehensive a study of the entire economic problems as time permitted. After this conference the groups of teachers were escorted through the mill.

The tours were concluded by 5:15, when all participating people attended a social hour. A dinner climaxed the day's program at which Mr. Schierl acted as Toastmaster.

General comments from the educators indicated they were very favorably impressed with all they had seen. They felt such a program had done much to point up business problems of today. Because of their improved knowledge of the local businesses and industries, they believed they could do a more intelligent job of teaching.

At Appleton, Cola G. Parker, president of the Kimberly-Clark Corp., Neenah, will be the principal speaker for the Business-Industry-Education day to be held March 9.

Twenty-nine firms have agreed to cooperate in the activities of conducting teachers from Appleton schools on tours of the business concerns. Informative talks will be given on the operation of the various businesses. The program is being planned by the Alleton Chamber of Commerce.

Corning Gets Safety Award

ELMIRA, N. Y.—The Corning Fibre Box Corp. has received an award from Associated Industries of New York State for its safety record during the final quarter of 1949. The firm was given a plaque for completing the period without an accident.

E. H. JENNINGS

Jennings Heads Thilmany

KAUKAUNA, Wis.—Elmer H. Jennings, associated with the Thilmany Pulp and Paper Co. for 32 years, has been elected president of the firm to succeed Karl E. Stansbury, it was announced recently by the board of directors.

Mr. Stansbury becomes chairman of the board of directors. C. R. Seaborne has been elected to the newly created office of executive vice president. Elections were held after the annual meeting of the stockholders.

Mr. Jennings has served as vice-president of Thilmany since 1936. He became a director and assistant secretary of Thilmany in 1928, but later served as secretary. With the development of new Thilmany products, he became actively engaged in full time sales work and took over complete responsibility in 1940.

Mr. Seaborne came to Kaukauna in 1918 as an assistant engineer and was largely responsible for the redesigning and rebuilding of the No. 2 mill, doubling its capacity.

Neubrech to Attend Montreal Meeting

WASHINGTON, D. C.—W. L. Neubrech, chief of the Pulp and Paper branch of Forests Products Div. Commerce Department, was named with other members of the Forest Products Div. and Forest Service of Agriculture Dept. to attend a series of meetings at Montreal, Canada, dealing with joint mobilization plans between the two countries.

The group will consider the field of forest products in the plan, including mutual problems that would affect pulpwood wood pulp, newsprint, and woods labor in an emergency.

Besides Mr. Neubrech, other mombers are A. E. Fivaz, Forest Products Branch, Office of International Trade, Commerce Dept.; H. L. Josephson, Forest Products Div., U. S. Forest Service; Frank Whitehouse, Munitions Board of the Dept. of Defense; and Arthur G. Peterson, also of the Munitions Board.

The group will report later to the U. S. chairman of the parent committee, Presidential Assistant John R. Steelman.

Columbia Aids In Rescue

PRINCE RUPERT, B. C.—Two vessels of the Columbia Cellulose Co., Ltd. are back at their home base here after participating in the thrilling rescue of seven men marooned at Greenville, 20 miles up the ice-locked Naas River. Candidate for hero's honors for organizing and directing the rescue operation was Howard Reid, coast logging superintendent of the company, which is now erecting a large dissolving pulp plant on nearby Watson Island.

Olin Industries Elects Hanes

EAST ALTON, Ill. — John Wesley Hanes, former Under-Secretary of the Treasury and widely known New York finance executive, has been elected a vice-president and director of Olin Industries, Inc., and appointed to the executive committee of that corporation, it was announced on February 15.

Among other positions of financial responsibility, Mr. Hanes is a director of Ecusta Paper Corp., Pisgah Forest, N. C., where a new plant will soon be constructed for the manufacture of cellophane under license from E. I. du Pont de Nemours & Co.

Hanks Resigns From Nepco

PORT EDWARDS, Wis.—L. M. Hanks, Madison, member of the board of directors of the Nekoosa-Edwards Paper Co. for almost 40 years, has resigned. Mr. Hanks, who was first elected on May 24, 1910, was widely known in industrial and financial circles and served as president and chairman of the board of the First National bank, Madison. He was president of the Central Wisconsin Trust Co., Madison, for many years.

In recognition of his service, the Nepco board of directors conferred upon him the title of director emeritus.

Neil E. Nash and Charles H. Reese, both of Port Edwards, were appointed to fill vacancies on the board of directors.

Kimberly Promotes Sharp and Catlin

NEENAH, Wis.—John R. Kimberly, sales vice-president of Kimberly-Clark Corp., this week announced the appointment of A. G. Sharp as general sales manager and J. B. Catlin, general merchandising manager. Mr. Sharp also acts as assistant to the vice-president. Each has been associated with Kimberly-Clark since 1930.

Eastern Leases Offices

NEW YORK — Eastern Corp., manufacturers of sulphite pulp and writing paper at Bangor, Maine, has leased executive and sales offices in the Lincoln Bldg., 60 E. 42nd street.

RICHARD G. CROFT

Named Chairman by Great Northern

NEW YORK — Richard G. Croft, a partner in J. H. Whitney & Co., has been elected chairman of the board of the Great Northern Paper Co., William O. McKay, president, announced yesterday.

Mr. Croft has been a director of the paper company since May, 1946. He is also a director of the Harbison-Walker Refractories Company of Pittsburgh.

D. B. Smith Heads Wausau Paper

BROKAW, Wis.—Effective March 1, David B. Smith will assume the duties of president and general manager of Wausau Paper Mills Co.

Mr. Smith entered the paper industry with Marathon Corp. in 1926 and remained with Marathon until 1938, when he became secretary and manager of Ward Paper Co., Merrill, Wisconsin. He later became president and general manager of that company and also president of Transo Envelope Co., Chicago, Ill., which company is the owner of Ward Paper Co.

D. C. Everest will continue his association with the company as chairman of the Board of Directors.

E. C. A. Paper Team Here

NEW YORK—A nine-week study of the U. S. pulp and paper industry has been started by representatives of European countries sponsored by E.C.A. On February 16 the group will visit the Stamford Laboratory of American Cyanamid to study the materials made by Cyanamid and to see a large research operation in action. They will attend the annual Paper week sessions in New York, February 20 to 23, and will visit the Institute of Paper Chemistry in March.

The specialists will meet in Appleton on March 26 and expect to operate, using the institute as a base, for about two weeks. Tours through various paper and pulp mills are being arranged.

In addition to their stop in Wisconsin, the European paper experts will visit the Weyerhaeuser Timber Mills and the Longview Fibre mill at Longview, Wash.

The 35 delegates are from Austria, Belgium, Denmark, France, Germany, Italy, The Netherlands, Norway, Sweden, Switzerland, Great Britain and Turkey.

Reminder for Rep. Cellars

There has been a deal of criticism of the publisher of the lamentably defunct *New York Sun* for his statement that the end was brought about by exorbitant demands of labor unions. And the poor chap now has no paper in which to answer back.

Evidence of malnutrition is not lacking. But the basic reason for the passing of many hundreds of big and little newspapers, daily and weekly, is the rise in costs of production. The rise goes right back to the woods where the pulp wood is cut. A camp dishwasher today is paid as much as a dramatic critic. And believe it or not, brains (reporters) now have a tendency to cost as much as mechanical ability (linotype operators).

In so far as a lessening in the number of newspapers puts editors, reporters, printers (who are typesetters), pressmen (who are printers), truck drivers and others out of work, these individuals have priced themselves out of the market for their services.

Or, to put it another way, they have been parties to narrowing their opportunities in that line of work.—*The Printed Word.*

Schedule Newsprint Inquiry

WASHINGTON, D. C.—Investigation of the newsprint industry by a House subcommittee under Chairman Emanuel Celler, (Dem., N. Y.) will follow a scheduled inquiry into the steel industry beginning March 15, the chairman announced after a White House visit at which the various plans were discussed.

Mr. Celler said the President had spoken approvingly of the plans for the various inquiries, which cover a wide industrial field. The committee held some hearings at the previous session, and is technically engaged in studying the need for modernizing anti-trust laws.

Nat. Container Names Smith

NEW YORK—H. Everett Smith, a vice president of the Marine Midland Trust Co. has been elected a director of the National Container Corp., it was announced yesterday by Samuel Kipnia, president. Mr. Smith is also a director of Sweet's Laboratories, Inc., and Gunmakers of America, Inc.

MacMillan Gives Bonuses

VANCOUVER, B. C.—H. R. MacMillan Export Co., Ltd., will distribute $430,000 in cash bonuses to its 5,000 employes. The grants will go to all employes below the rank of assistant manager. Bonuses totalling $560,000 were distributed last year. Amount received by each employe will be calculated on term of service basis subject to special variations.

Chairman H. R. MacMillan said the company's business is going well and will continue that way for at least a few months. He mentioned the new pulp mill being built at Nanaimo, B. C., which he said would play an important part in the future of the company.

Commenting on changes last October in top management of the firm, Mr. MacMillan reported his new organization is "working splendidly." All officers and directors were re-elected.

H. F. DUNNING

Scott Tells Its Employees

FORT EDWARD, N.Y.—The Marinette Paper Co. employes in the local plant again had the opportunity of hearing a complete story about their business when Harrison F. Dunning, Scott Paper Co.'s general manager of paper mills, presented his third edition of "How're We Doing?"

A series of three meetings was held in the plant so that employes working all shifts could attend sessions. In all, 630 persons were present. Mr. Dunning made three presentations at the South Glens Falls plant were 140 persons were present. His informal approach to the annual business review, which includes the mentioning of many personalities, does much to make his audiences a real part of the program.

Paper Mill Air Compressor Operation

By

TYLER G. HICKS

Mechanical Engineer, Charlottesville Road, Summit, New York

The average pulp and paper mill uses at least one air compressor for cleaning, humidification, valve operation, or fire protection. A few examples of typical application are: cleaning of slashers, motors, switchgear, and floors; spray type humidifiers, digesters and dryer control valve operation, and automatic sprinkler systems. Built to withstand wide variations in load, speed, and pressure, an air compressor can be one of the safest pieces of equipment in the mill — if properly operated and maintained. Poorly operated compressors can be a hazard to all mill personnel, the mill structure and machinery. To insure safety and high quality products, paper mill maintenance men should take a quick look at what constitutes good practice in air compressor operation.

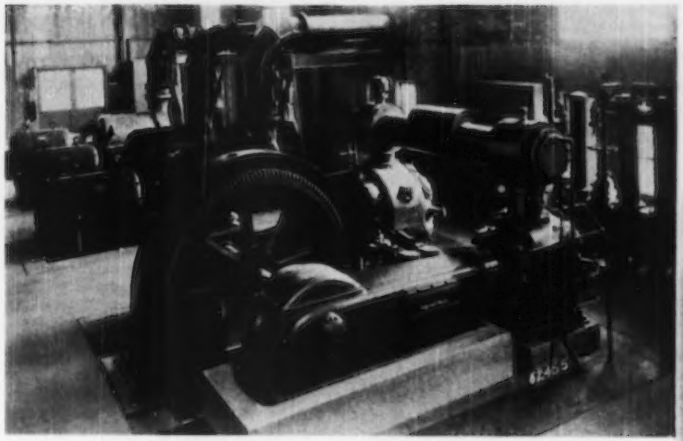


Figure 1. Neat compressor installation in which all moving parts are guarded. Sufficient working area around the unit and good lighting aids maintenance.

Guards

Prevention of personnel injury through contact with compressor belts, pulleys, flywheels, shafts, cranks, and other moving parts is facilitated by use of suitable guards. Screens, enclosures, and handrails are easily applied after the compressor has been installed. Although guards may increase the cost of an installation somewhat, they are well worthwhile from the standpoint of greater safety, especially when persons unfamiliar with machinery are in the vicinity of the compressor. Hence, it is a good policy to guard all compressors, regardless of their location.

Compressor location

Operators have suffered injury from causes other than contact with moving parts of the compressor. Failure of some member of the air compression system has caused explosions in paper mills. Investigation showed that the cause of the explosion in certain cases was improper location of the compressor and in others, poor operation and maintenance methods. Neglect of lubrication, intake air cleanliness, air cylinder temperature, or inadequate inter- and after-cooling will usually lead to trouble. Since many of these factors are dependent upon compressor location, its importance can readily be seen.

All paper mill air compressors should be located in a clean cool place. Provision of ample room on all sides will aid inspection, cleaning, and repair of the unit. Closed corners, boiler rooms, and spaces subject to accumulation of dust and dirt must be avoided. Adequate lighting is essential for all types of work on the compressor. Foundations should be well built and given sufficient time to harden before the compressor is installed. Rigid foundations which will minimize vibration are necessary. A mixture of one part cement, six parts broken stone, and three parts coarse sand is usually recommended for foundation construction. After the compressor has been installed, the problems of safe daily operation must be solved.

Lubrication

Lubrication of the air cylinder is one of the most important phases of paper mill air compressor operation. The proper amount of oil to be used in the air cylinder depends upon the size of the cylinder and upon the volatility and viscosity of the oil. Incorrect lubrication is generally thought to be a major cause of explosions. High air temperatures in the cylinder will usually evaporate or decompose an oil film. Decomposition of the oil leaves a gummy mass which collects around valves and passages. When united with dust from the air, a hard deposit which obstructs valves and passages is formed. The correct amount of suitable oil is therefore important.

In general, blends of "cylinder stocks" are unsuitable for air cylinder lubrication. In cases where excessive moisture is present, a compounded oil may be used. The manufacturer will always give recommendations as to the grade and quantity of oil to be used. A rule which is conservative and fairly representative of average practice is 1 to 4 drops per minute for small compressors, 6 drops per minute for medium size units, and 10 to 12 drops per minute for large compressors. *Table I* gives suitable oil quantities for lubrication of paper mill air compressor cylinders.

Cylinder deposits

Deposits which result from burning or charring of the lubricant are carbon. In some compressors the carbon is found in dust form instead of solid deposits. In either case, if high enough temperatures are encountered during the cycle, ignition of the deposits is almost certain to result. Carbon deposits around compressor discharge

Table I
Suggested Oil Feed Rates

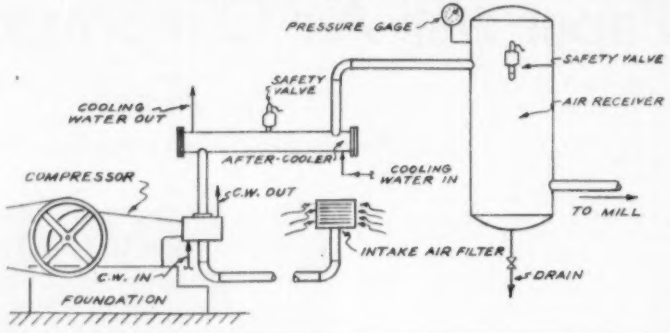
Cylinder Size, inches	Cubic Feet of Air/Min.	Piston Speed, Ft./Min.	Drops of Oil per Min. to the air cylinder
6 x 6	57	330	1
8 x 8	124	354	2
10 x 10	228	416	2
12 x 12	371	470	3
14 x 15	561	525	4
16 x 15	730	525	4
18 x 15	930	525	5
20 x 15	1146	525	6

valves are especially dangerous. Such deposits prevent full closure of the valves. As a result, some of the high pressure air in the discharge line reenters the cylinder on the next suction stroke. This air is generally at a higher temperature than the atmosphere; hence, the final temperature of the mixture after compression may be high enough to ignite the carbon. It can therefore be seen that carbon deposits must be removed regularly and thoroughly.

Several means are available for carbon removal. A soap solution of one pound of soft soap and eight quarts of water is cheap and effective. The solution is fed to the air cylinder at a rate of about ten times the oil feed. Alternately, a lye solution may be fed into the discharge pipe. One pound of lye dissolved in ten quarts of water and fed into the discharge pipe by means of a sight feed lubricator is generally satisfactory. Feed rate should be 60 to 70 drops per minute. To prevent rust after application of either lye or soap, the air receiver should be drained and the compressor operated for half an hour with the normal lubricant.

Some compressors cannot be cleaned with solutions. In such units hand cleaning must be adopted. When cleaning by hand, extreme care is necessary to prevent scratching the cylinder walls and valves with cleaning tools. Under no circumstances should gasoline, kerosene, naphtha, or any other flamable substance be used to soften carbon. Formation of explosive mixtures with the attendant danger prohibits the use of all materials of this nature. Regardless of the cleaning method used, strict regularity must be observed. A weekly cleaning is nominal for the usual paper mill, though many operate for longer periods without cleaning. The periods between cleaning will be determined to some extent by the condition of the intake air.

Figure 2. Essentials of a safe air compressor system. Each part of the system must receive careful attention during maintenance.



Intake air

Intake air should be drawn from a region which is clean and cool. The use of an air intake filter is generally recommended because cleaning and maintenance time is reduced by its use. All types of undesirable matter may be drawn into compressor cylinders which are not protected by filters. Insects, lint, dust, and soot are the most common in paper mills. The amount of air contamination depends on plant location and intake pipe height.

The air intake line should be 8 to 10 feet above the ground or roof level. Short, straight lines without turns, pockets, or traps reduce friction losses and prevent moisture accumulation. If pockets in the intake pipe cannot be avoided, suitable drains should be installed and checked daily. Moisture has little effect on fire and explosion danger but does have a tendency to cause increased corrosion. Clean, moisture-free air will decrease inlet valve wear and help maintain low air cylinder temperatures.

Air cylinder temperatures must be as low as possible at all times. Vaporization and decomposition of the cylinder lubricating oil will decrease with temperature. Low air cylinder temperatures can be obtained by providing clean, cool air at the intake, by operating the compressor at its rated speed, and by circulating a sufficient quantity of cooling water.

Compressor cooling

Cooling water quantity is dependent upon inlet water temperature and compressor load. As the compressor load and inlet temperature of the water increase, the quantity required also becomes larger. Cold water from a dependable source is necessary. Sight glasses or open discharges provide visible means of checking water flow from the air cylinder and inter-cooler. A continuous flow of water will prevent overheating and will reduce jacket scale deposits.

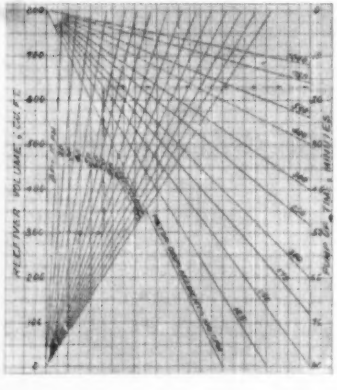
Jacket scale deposits reduce the effectiveness of the cooling water. As a result, overheating of the cylinder will often occur. Scale may be removed from the water jacket walls by filling the jacket with a hot solution of caustic soda. Sufficient time should elapse to permit removal of the scale before draining the jacket. Application of a scale removal compound once a year is usually sufficient for properly operated compressors in paper mills. Clean jackets will prevent excessive air temperatures in the compressor discharge piping.

Compressor discharge

Air discharge pipes should be at least equal in size to the diameter of the opening in the air cylinder and should run full size to the receiver. Vertical loops, bends, and traps which might provide a place for moisture accumulation must be avoided. Provision for expansion and contraction of the piping is necessary to reduce stresses in the lines. To avoid pulsation and vibration during periods of load changes, well anchored hangers are worthwhile. Piping should be located at a height which will permit free discharge of any safety devices in the discharge piping.

Safety devices for air compressor discharge piping in paper mills are generally of the fusible plug or spring loaded types. Fusible plugs which act as whistle alarms and relieve pressure in the event of high air temperatures must be kept clean and in operating condition at all times. Safety valves are usually maintained in the same manner as those on boilers. By keeping the discharge of these devices high or directed away from the probable position of an operator, many injuries will be avoided. Well installed discharge piping will safely supply air at

Figure 3. One way of checking on compressed air system equipment condition is by timing the unit during receiver pump up. This chart permits easy determination of the approximate pump up time for a system in good condition. Use is as follows. Example: How long should it take to pump up a 300 cu ft receiver with a compressor having a piston displacement of 150 cubic feet per minute if the "cut in" pressure is 200 psi and the "cut out" pressure is 300 psi? Solution: Enter the chart at a receiver volume of 300 cu ft and project horizontally to $\Delta p = 300 - 200 = 100$ psi. From here run up the chart until the 150 cfm displacement curve is intersected. Then project to the right to read 17 minutes, pump up time. If considerably more time is required to pump up the receiver, the system should be checked.



the correct temperature and pressure to the receiver.

Air receivers

Receivers store high pressure air for future use, create a cushion, eliminate vibration, precipitate oil and moisture, and cool the stored air. ASME and local codes govern the construction and materials for most receivers in paper mills. Working pressures should never exceed those specified by the manufacturer. Satisfactory operating results can be obtained from approved air tanks only when they are properly located have the required pressure indicating devices, and are suitably connected by piping to the compressor and load.

Air receivers should be located as close as possible to the compressor. They must never be buried underground or located in hot, restricted corners. Accessibility is the keynote of good performance and easy maintenance. Internal inspection of the receiver every year will reveal any corrosion or pitting of the surfaces.

All receivers should have an accurate pressure gage, a safety valve, and a drain pipe fitted with a valve. Connection of the drain line to the lowest point in the receiver will insure proper removal of oil and water. The receiver maintenance program, if well planned, always includes blowing down of accumulated moisture and testing of the safety valve. Frequency of such tests will depend upon the amount of oil and moisture entering the receiver from the inlet pipe.

Piping to the receiver should slope towards it. If stop valves are necessary in the line, a safety valve must be installed near the compressor between it and the stop valve. Globe valves cannot be used for stop valves; instead gate or straight-way type valves are used to prevent accumulation of oil and water in the valve body. The likelihood of explosions is thereby reduced.

Safe air compressor operation in paper and pulp mills is within the control of every maintenance man. The methods described in this article are but a few of those which can be used to supply safer and more dependable service to the mill.

Fries To Receive Everest Award

MADISON, Wis.—Dr. Robert F. Fries, former University of Wisconsin graduate student, La Crosse, has received the first annual David Clark Everest prize of $1,000 for a book length study of the lumbering industry in Wisconsin, according to the Wisconsin State Historical society.

Dr. Fries' manuscript is entitled: "The History of Lumbering in Wisconsin—1830 to 1910: A Study in Industrial Planning."

The prize money is paid out of a fund given to the historical society by D. C. Everest, president of the Marathon Corp. to encourage research and writing in Wisconsin economic affairs.

G. J. TICOULAT

Sales Executives to Visit England

SAN FRANCISCO—G. J. Ticoulat, manager of sales for Crown Zellerbach Corp. and president of the San Francisco Sales Managers Assn., will join a group of sales executives who will sail aboard the Queen Mary from New York March 4, going to England to teach British business men, at their request, how we sell our goods in this country. Four phases of selling will be concentrated upon: (1) Selling directly to consumer; (2) Selling to retailers; (3) Selling through wholesalers; and (4) Selling heavy durable goods to industry.

Iran May Enter Paper Field

OTTAWA—The Government of Iran, it is forecast in a report by G. A. Browne, Canadian Government Trade Commissioner in Karachi, may participate in the chemical and paper industries. This is part of Iran's plan, involving the expenditure of approximately $650,000,000 over a period of seven years, for the further development of Iran and the improvement of living conditions for the people of that country.

Marinette Changes

FORT EDWARD, N. Y.—D. B. Wilkinson, general plant manager of the Fort Edward plant of the Marinette Paper Co., has announced several changes, appointments and promotions at the plant as of the first month of 1950.

In the paper mill, Gilbert L. Heath, superintendent, will be assisted by three divisional managers, Nathan G. McLean, Robert J. Kitchen and Edwin A. Hanna.

In the finishing department, Russell H. Jones, finishing superintendent, will have as his assistant Albert N. Garrett.

Robert E. March, technical control director, will be assisted by James S. Tipka.

William S. Spiller leaves his position as materials control engineer to become chemist in the technical control department. Jack M. Hiltz, a chemical engineer, has been appointed materials control engineer.

George L. Dahm, superintendent of the traffic and stores department, will be assisted, in addition to his present staff, by John H. Wartluft as bulk and vital supply receiving and handling foreman.

These moves have all been brought about primarily as the result of establishing the South Glens Falls plant as a separate mill.

Protest Toll Increase

PHILADELPHIA, Pa. — Philadelphia shipping interests have joined a nationwide protest by the maritime industry against a proposed increase in Panama Canal tolls.

Telegrams asking support in having the higher tariff schedule postponed indefinitely have been set to President Truman, local Congressmen and Senators, and to those in both Houses who are concerned with the merchant marine and waterways.

The shipping industry does not wish to pay tolls which include large elements of national defense cost or for military and civil government functions in the Canal Zone.

A typical cargo vessel pays $14,000 for a round-trip through the Canal, an amount equal to one month's wages for its 45-man crew, or the cost of operating the same vessel for six days at sea.

Diamond Completes Centralization

SPRINGFIELD, Mass.—Officials of the Diamond Match Co. announced recently that the centralization of its book match department and the organization of a new national book match headquarters in the Paridon street plant had been completed. Consolidation of the scattered offices of the department into a single organization in Springfield was begun two months ago.

Hayward Aids in Government Survey

KALAMAZOO, Mich.—Ralph Hayward, president of Kalamazoo Vegetable Parchment Co., was recently chosen one of fourteen top Michigan industrialists and four college deans to help in making a survey of state government. The group was chosen by the legislative committee on state reorganization. The plans are to begin the surveys on state agencies in February.

L. J. Hill Joins Brown Co.

BERLIN, N. H.—Layton J. Hill, formerly production manager with the Eberhard Faber Pencil Co. in New York, has joined the Paper Manufacturing Division of Brown Co. at Berlin, N. H.

State Forest Products Research in Michigan

HEREFORD GARLAND

Director, Forest Products Research Division, Michigan College of Mining and Technology

Abstract

Although the forest resources and the forest products industries of Michigan have changed markedly since the time when it was the Nation's leading lumber producer, these are still major elements in the economy of the state. Forest products research has been officially recognized as an instrument for guiding changes in wood production and wood use toward economic development. Three state educational institutions are applying staff and facilities to the problems of wood utilization and two state departments are actively involved in the industrial application of forest products research results. The efforts of all of these Michigan agencies are coordinated, and reviewed by industry representatives.

The history books give us a rather dismal picture of Michigan as a land where the timber barons cut out and got out leaving behind stumps, tax delinquent land and a wood-using industry without wood to use. This picture never was quite right and, of course, it presents an entirely false impression because it is static and takes no account of the dynamic factors that have been active since the "good old" white pine days. The true story of forest products in Michigan is a moving picture in which changes are continually taking place. Forest products research can have an important part in developing and modifying the picture.

Significance of the Forest Products Industries

Timber Resources

It is true that the great bulk of the readily accessible standing timber has been removed but the timber growing lands for a great portion of the state have remained as such and have been more or less productive. Fire in the past has deteriorated the growing capacity of many thousands of acres but fire is now being controlled and these lands are slowly recovering. Much of the timber land that was once termed cut-over has again attained commercial importance with the yield of a second crop and other large forest areas may be expected to grow into this classification within the foreseeable future. In the southern part of the state the original timberland was mainly converted to farming but even here the inevitable farm woodlot has become a commercially significant timber producing factor.

The moving resource picture in Michigan shows timber growth approaching a balance wtih timber drain and indicates the probability of an eventual increase in wood supply for industry.

The relative importance of Michigan timber species has changed and will probably change further. White pine is little more than a memory but the northern hardwoods which were passed over by the early lumberman as inferior species are enjoying a better demand than white pine ever did. In recent years hemlock has gained a respectability denied it in a softwood lumber market dominated by pine. With the growing scarcity of spruce, pulp mills have cultivated an appetite for balsam and now the lowly "popple" or aspen has become a full fledged pulpwood species. How soon aspen will become recognized in the lumber trade as a suitable substitute for the vanishing basswood will depend somewhat on forest products research.

The stumpage value picture is dynamic, too. No species has a negative value, and with a high component of maple and birch the northern hardwood timber stands undoubtedly contain more value per acre than any in the country with comparable volume.

Michigan's timberland ownership pattern has become progressively less fluid. Tax deeded cut-over lands which once were the natural aftermath of logging have now been fairly well blocked into state and federal forests and are being managed to sustain a future industry. Timberland values as well as stumpage values are being recognized by private owners and the meaning of tree reproduction is becoming increasingly significant. More and more timber operators are practicing some form of selective cutting. The modern tendency to retain timberland for its growth potential is disclosed in a recent study of ownership in the Upper Peninsula. Two million four hundred thonsand acres, or 45 percent, of the privately owned commercial forest land is in ownerships of 1,000 acres or more. This is particularly significant in consideration of the fact that the old-growth hardwood forest type amounts to less than 800,000 acres in that area.

Although Michigan's proper nickname is the "Wolverine State," it is sometimes facetiously referred to by foresters as "The Forestry School State" because it is the only state offering professional forestry training in three different institutions. Actually, this constitutes recognition by the public and the career-seeking undergraduates that the forest resource and its utilization is a large factor in the economy of the state.

Wood-Using Industries

The primary wood-using industries, those depending directly upon the forests for raw material, have undergone transitions correlated with the changes in the resource and in the general economic position of the state. Gone are the huge pine mills which at their peak cut over 5 billion feet of timber annually. However, sawmilling is still an important activity. There were 1,900 active sawmills reported in Michigan for 1947, with a total production of 580 million board feet. Sixty-five percent of that production was hardwood and nearly forty percent of the total was birch and maple. The trend in sawmilling is toward smaller production units and smaller lower grade logs.

Sawmilling no longer dominates the forest products picture as it once did. There has been a strong trend towards diversification of the primary wood-using industries. Pulp mills constitute a major factor in the total cubic-foot wood harvest. The choicest portion of the sawlog stand is now consigned to veneer mills. Michigan has two of the largest and most efficient hardwood

distillation plants in the country. Rough wood products such as mine timbers, posts, and ties account for a considerable timber harvesting industry.

The unused wood by-products from logging and primary milling present a challenge to the forest products researcher in Michigan as they do in all other timber producing states. However, the problem here fortunately is unique in that this potential raw material is readily accessible for concentration at a processing point and is located within a relatively short shipping distance of important product consuming areas.

The secondary wood-using industries of Michigan, those using lumber or other partially manufactured wood as raw material, are not particularly integrated with the timber resource. While most of the product of the northern forest is shipped out of state as rough lumber and pulpwood, the wood products manufacturing plants in the southern area import a large proportion of their raw material from other states. The Grand Rapids furniture industry which had its beginnings when Michigan timber was readily accessible to it as raw material has stayed in place and developed primarily because of manufacturing and merchandising "know how." Then with the industrial growth of the state a great variety of wood product manufacturing plants became established in southern Michigan. There were 542 plants producing finished wood products in this part of the state in 1939 and there is reason to believe that there has been some expansion since then. In the Upper Peninsula, the forest products industries are still predominantly primary in character but there is a definite tendency to take advantage of the economies of remanufacturing the northern species near the source of supply.

The forest products industries form an important facet in Michigan's economy and they will undoubtedly continue to change and develop as they have in the past. Forest products research can help to guide the changes and stimulate development.

Forest Products Research as an Instrument of Economic Development
State Sponsorship

The first direct recognition of forest products research as a state activity in Michigan came in 1944. The Upper Peninsula Technical and Advisory Committee to the Michigan Planning Commission was at that time studying the economic problems of that area with the aid of a number of industrial sub-committees. Two of these sub-committees, one on forest products and the other on chemical and metallurgical processes, recommended that a state appropriation of $25,000 be made for a study of the possibilities in the industrial utilization of wood. This recommendation was promptly passed through the regional advisory committee and the Planning Commission to the Governor and the Little Legislature. In October 1944 allottment of the requested funds was made to the Michigan Planning Commission and the Governor appointed a Forest Products Research Committee to advise the Commission on the use of the fund. The Committee was composed of representatives of the three state technical institutions, the Department of Conservation, and several branches of the wood-using industry with Dr. Grover C. Dillman, President of Michigan College of Mining and Technology, as Chairman.

The Advisory Committee's first action was to call upon a small group of consultants from state agencies to study the overall wood utilization problem in Michigan and to propose specific research projects. This group, working under the direction of Mr. Stanley G. Fontanna, Deputy Director of the Michigan Department of Conservation, reported to the Advisory Committee in 1945. Its findings were published as a bulletin of the Michigan Planning Commission in 1946 under the title "Wood Utilization Problems and Possibilities in Michigan."

The six most urgent projects recommended by the consulting group were assigned to three appropriate state research institutions with funds allotted for the work. Reports on these projects were published in 1947 as bulletins of the Michigan Department of Economic Development, as follows:

- Inventory and Directory of Wood Using Industries of the Upper Peninsula of Michigan, by Hereford Garland, Michigan College of Mining and Technology.
- Small Sawmill Improvements — A Progress Report, by Richard C. Johnson, Michigan State College.
- The Michigan Wood Turning Industry — Status and Outlook for Expansion, by A. J. Panshin, Michigan State College.
- Manufacture and Use of Small Dimension — A Progress Report, by Robert Craig, Jr., University of Michigan.
- Wood Defiberization — A Progress Report, by Robert Craig, Jr., University of Michigan.
- Utilization of Aspen — A Problem Analysis, by Hereford Garland, Michigan College of Mining and Technology.

National Conference

Besides periodically reviewing progress on the state projects, the Forest Products Research Advisory Committee of the Michigan Planning Commission considered the overall aspects of a state program. At a meeting in July 1945 it was suggested that other states might be concerned with similar programs to develop forest products industry. It was the recommendation of this Committee that the Planning Commission approach other state agencies and the Forest Products Laboratory proposing a national conference to exchange information on forest products research programs. The result of this recommendation was the Conference on State and Federal Forest Products Research Programs held at Madison on March 18 to 20, 1946. It was sponsored jointly by the Forest Products Laboratory and the Michigan Planning Commission. The collected papers of the conference provided a valuable fund of information on the current activities of virtually all public agencies engaged in forest products research.

During the course of keynoting the conference Dr. Dillman posed the question "Should we not consider the advisability of forming a permanent organization to facilitate the interchange of forest products research information?" Specific action was taken on this question when Dean Samuel T. Dana, one of the Michigan Planning Commission advisors, moved that a committee including representatives of industry and public agencies be charged with the responsibility of planning a permanent national forest products organization. From these beginnings the Forest Products Research Society was launched in early 1947. Michigan may be justly proud of the enthusiasm, as measured by the phenomenal growth of the Society, with which her pioneering suggestion has been received.

Michigan Forest Products Research Agencies
University of Michigan

Since the organization of the School of Forestry and Conservation at the University in 1927, wood technology has had a place in the research program both at the staff and student levels. This work has had more emphasis since 1934 when a separate curriculum in wood technology was first offered. Graduate problems and staff projects have covered a wide range of topics, mostly on the mechanical and physical properties of woods and wood products, and wood fabrication procedures.

For the past several years the staff of the wood technology laboratory has been in a position to engage in contract research handled through the Engineering Research Institute of the University. One major project in progress at this time is a study of adhesives in furniture manufacture supported by the National Association of Furniture Manufacturers. Financial support for forest products research comes from regular state University appropriations and from cooperators.

In 1948 the school formally opened an expanded Wood Technology Laboratory devoted to teaching and research. The 17,000 sq. ft. of space provides separate laboratories for the study of wood structure, wood machining, wood finishing, and testing and gluing. Also included are a fully controlled dry kiln and experimental pressure treating plant, a tool grinding shop, and controlled temperature and humidity rooms.

Three staff members, William Kynoch, Robert Craig, Jr., and L. A. Patronsky, are assigned to teaching and research in wood technology on a full time basis. The work is under the administration of Dean S. T. Dana.

Michigan State College

The Department of Forestry here has carried on forest products research on the graduate level mainly since 1935. The graduate problems have included kiln drying, fire proofing, wood structure studies, forest products merchandising, maple syrup production, wood stabilization, radio frequency gluing, and lumber grade production studies. Staff projects have included industry surveys and the improvement of sawmill equipment.

Present projects are concerned with methods of chemical seasoning of lumber and the preparation of an extension bulletin on the construction and operation of lumber dry kilns. Financial support for forest products research comes from state and federal appropriations and governmental or industrial cooperators.

Wood utilization research facilities at Michigan State have been expanded in recent years. They include a modern dry kiln, a pressure treating plant, a general wood working shop, and a glue and press room. A new sawmill building houses a circular sawmill and provision is made for the installation of a band mill. Plans have been made for a finishing laboratory.

Staff members assigned to wood utilization and technology are A. J. Panshin and J. W. Creighton. They divide their time between teaching and research. Dr. P. A. Herbert is head of the Department of Forestry.

Michigan College of Mining and Technology

Forest products research activities were begun at the college with the initial phase of the Planning Commission program. The two projects assigned to the college were carried out by a staff member during 1945 and 1946.

In 1947 the present forest products research program at Michigan Tech was authorized by the State Legislature, and the Forest Products Research Division was established by the Board of Control of the College. It was specified that the work be directed at the utilization and marketing problems of wood industries in the timbered areas in the state. Planning and progress of the projects are reviewed periodically by an advisory committee composed of eleven representatives from the various branches of the wood-using industries and four representatives of other research agencies.

The present program consists of four projects: (1) Hardwood fiber production—a study of the possibilities of producing corrugating board from logging residues; (2) Utilization of low grade hardwood lumber—an investigation of the use of small cuttings through mechanized preparation and fabrication; (3) Timber harvesting—the mechanization of sawlog and pulpwood logging; (4) Industry development—spot studies and technical aid of a local or individual nature. Graduate problems involving wood utilization in the engineering departments of the college are guided by the personnel of the Forest Products Research Division.

Research facilities in the laboratories of the Mechanical-Civil, Electrical, and Chemical Engineering departments of the college are available for the program. Wood processing is carried on in the maintenance shops where some equipment required for research has been installed, including a radio frequency generator, gluing equipment, and special cutting tools. Financing of the program is handled as a special item in the state appropriation to the College.

The Forest Products Research Division is staffed by five full time technical men, Hereford Garland, A. W. Toole, W. H. Koepp, L. W. Hooker, and C. W. Danielson, Jr. The staff is responsible to Dr. G. C. Dillman, President of the College.

Michigan Department of Conservation

This Department took an active part in the Planning Commission program and continues to cooperate with other state agencies on forest products problems. Mr. S. G. Fontanna, Deputy Director, is a member of the Forest Products Advisory Committee of the Department of Economic Development.

The Forestry Division has recently initiated a research program under the supervision of Norman F. Smith. One project in progress is a survey of the wood-using industries of southern Michigan. The work of the Division on private forestry cooperation is in charge of T. E. Daw and his functions are intermittently concerned with forest products problems.

Michigan Department of Economic Development

The Michigan Planning Commission was abolished by the legislature in 1947 and some of its functions were assumed by this new agency. On the recommendation of the Forest Products Advisory Committee of the Planning Commission this committee was reconstituted under the new Department. This Committee is composed of industry representatives and representatives of all state agencies concerned with forest products research. Its function is to foster development of the wood using industries and to coordinate state research efforts. Mr. John W. Dregge, of Grand Rapids, is Chairman.

One staff member of the Department is a professional forester, George E. Billings, who is assigned to handle industrial development problems.

Cooperating Agencies

A discussion of forest products research in Michigan would be incomplete without mentioning the splendid cooperation of the U. S. Forest Service. Although the Lake States is the only eastern forest region that does not have the benefit of a Forest Utilization Service Unit, Michigan agencies have received much effective attention to problems of wood use presented to Director G. M. Hunt and the staff of the Forest Products Laboratory.

The Lake States Forest Experiment Station has frequently been called upon to supply data in connection with Michigan forest products problems. Director E. L. Demmon is a member of the Forest Products Advisory Committee of the Department of Economic Development.

The preparation of the Lake States Aspen Report series, which is a region-wide group effort under the leadership of the Lake States Forest Experiment Station, is a fine example of inter-agency cooperation on a common wood utilization problem.

Marinette Completes Forest Survey

MARINETTE, Wis.—Field and office work has recently been completed on the Marinette County Forest Survey by S. W. Welsh and 12 other foresters of the Conservation Dept. This is the first county to complete the survey, which will eventually be conducted all over the state.

The county board committee in charge of Marinette county forest realized that if the forest was to yield the maximum volumes of timber, growing stocks must be built up. Timber sales have been on the whole limited to low grade species or mature trees left in the original logging, except during the war years.

"For forest management," F. G. Wilson, superintendent of Co-operative Forestry, stated for the survey, "we need figures on present merchantable volume, young growing stock and volume increment by species, forest type and size classes. Similar figures on drain resulting from natural losses are also required. These values are tabulated in this report. They will lead to determination of the allowable cut for the next ten years."

Because of new methods of mapping forest trees, size classes and degree of stocking from aerial photos, it was possible to conduct inventories without the prohibitive cost of cruising. Aerial photos, taken on infra-red film using a blue filter, were at a scale of 1:12,000. The procedures and standards were guided by the Lake States Forest Experiment Station.

Acreage figures for each forest type, size and condition class were determined and the number of plots for adequate sampling of each was computed. This called for approximately

850 one-fifth sample plots and 2,900 sample trees for volume and growth data. The accuracy of the mapping was tested at the time the sample plots were taken and was found to be within prescribed limits. The standard error of volume varied from ± 8 per cent to ± 75 per cent, being largest in classes of small acreage, or low value. The sampling error for the timber volume was ± 2.6 per cent.

With most of the county forest having been resurveyed, giving true bearing and distance between land corners, good base maps were available for type mapping. Following some corrections in the field, these type maps were enlarged to a scale of eight inches to the mile by use of the multiscope. Since the location of the timber must be known for allocation of the allowable cut, this atlas of section type maps will be of great value. They may be combined to provide township maps of smaller scale. While all this information is needed by the forester, it should be understood that the individual timber sales must still be based on examination of the area to be cut.

Figures made available by the survey (based on the 1948 acreage): Total acres in County Forest, 218,280. Forest land, 213,930, or 98 per cent. Non-forest land (water, rock outcrop, marsh, roads, etc.), 4,350 or 2 per cent.

Distribution by cover type: Aspen, 46 per cent; pine, 11 per cent; northern hardwoods, 10 per cent; coniferous swamps, 9 per cent; scrub oak, 9 per cent; swamp hardwoods, 5 per cent; grass and brush, 10 per cent.

Distribution by stand size class: Large saw-timber, 980 acres or 0.5 per cent; small saw-timber, 4,220 acres or 2 per cent; pole-timber, 40,510 acres or 18.9 per cent; reprpduction and sapling, 109,470 acres or 51.2 per cent; understocked, 58,750 acres or 27.4 per cent.

Timber volumes: Saw-timber, 50,500,000 sq. ft.; pole timber, 405,000 cords; total merchantable volume, including tops and converted to cords, 532,500 cords. Aspen makes up 40 per cent of the cordwood volume.

Drain by cutting (1947-48 average), 11,000 cords (80 per cent was pulpwood production—51 per cent was aspen).

Growth of cordwood (annually for the next ten years)—38,200 cords.

New Hampshire's Sawtimber Increases

WASHINGTON, D. C.—New Hampshire's forests today contain 27 per cent more potential lumber than the United States Forest Service estimated them to have four years ago. The new figures, based on surveys conducted by the Northeastern Forest Experiment Station, shows 9,713,200,000 board feet of sawtimber in the State. This is 2,103,200,000 board feet more than was shown in previous Forest Service estimates published in 1946. The new figure is a net estimate and includes no board foot estimate for cull trees.

Forestry Wage Exemptions

WASHINGTON, D. C.—The Wage and Hour Division of the Labor Department has issued an interpretation of its "forestry or logging operations" exemption which differentiates against employees engaged in sawmill operations or other such activity, as compared with workers engaged entirely in forestry work.

The new exemptions under the law, it is pointed out, provide complete exemption from minimum wage and overtime provisions for "any employee engaged in planting or tending trees, cruising, surveying, or felling timber, or in preparing or transporting logs or other forestry products to the mill, processing plant, railroad or other transportation terminal" if the number of such workers employed does not exceed 12 for any employer.

Not exempt however, are "employees engaged in a sawmill, tie mill and other operations in connection with processing of logs, such as production of lumber."

Furthermore, the department emphasized, the exemption is not applicable in the case of an employer who has a total of 13 or more employees engaged in the described forestry or logging operations. The limit of a total of 12 employees is drawn, regardless of how they may be divided among crews or work shifts. Employers can claim the exemption if they have 12 or fewer employees in the exempt operations, as well as other employees in nonexempt work.

Protest "Contract Logger" Definition

AUGUSTA, Me. — Management of Maine's paper mills is protesting to the Maine Congressional delegation over a new definition of "contract loggers" in the Social Security measure before the Senate. The definition which makes these loggers employes of the mills would have serious and far reaching effects on the industry, the Congressmen are being told.

The problem is not unique with the pulp and paper companies, but the paper industries, like many other big companies, depend on others for the bulk of their raw materials.

Even in Maine with its vast forest reaches which are to a considerable extent owned or controlled by paper companies, it is necessary for most mills to get pulp wood from a number of different sources and to make arrangements for others to do much of the cutting and hauling.

These contracts or deals vary widely. In some cases dealers, producers, farmers or contractors deliver wood at the mill with their own employes and their own trucks. In some cases the trucking or other phases of the work is subcontracted. And in many instances the paper companies themselves arrange for transportation of the wood, either with their own employes and trucks, or by contract with motor carriers, barge or railroad.

The mill officials fear that if paragraph four of the proposed definition is enacted, traditional methods of obtaining pulpwood will be radically altered, and the death knell will be sounded for many small business men now acting as independent contractors for producing pulpwood.

Opposition is being expressed by mill officials, dealers, producers and contractors alike, who feel paragraph four will leave in doubt the status of many as to what social security tax they or the mill should pay and would lead to expensive litigation and drive thousands out of business.

They are telling their Congressmen that the definition of employe in the present Social Security Act should remain, arguing that it is correctly set forth in common law and has been honored by centuries of acceptance.

Under the common law definition followed in the present act the test of whether or not a person is an employe is dependent on whether the person for whom the services are performed has the right to control and direct the individual who performs the services not only as to the result to be accomplished by the work but also as to the details and means by which that result is accomplished. This obviously wouldn't apply to the farmer, logger or other operator whose only contact with the mill is when he arrives with a load of pulpwood and collects for it.

Vigorous opposition to the definition was expressed when the measure was before the House Ways and Means committee, but it was passed and has gone to the Senate.

Lack of Snow Slows Wood Operations

OTTAWA — Lack of snow is said to have hampered woods operations of the Canadian International Paper Co., the Eddy Co., and the James MacLaren Co., of Masson and Buckingham, Que. The companies are engaged in taking out pulpwood for this year's operations in their mills but the lack of snow is slowing up the work.

Approximately a foot of snow is needed to get going, it is learned, and though the logs are being brought out, they are getting stuck on stumps and the operations are behind schedule. In some instances it is said crews had been hired, let go because of lack of snow to get out the logs, and later rehired. Jobbers, who are paid the full amount of their contracts when the logs are in the rivers, are reportedly finding it extremely difficult this winter to fulfill their contracts, with many thousands of logs awaiting good weather for the completion of operations.

To Lift Timber Control

OTTAWA—It is understood that timber control, such as logs and pulpwood, will be lifted when the present legislation expires March 31 so that control over price and movement will return to private industry for the first time in many years.

Fabricating Quality and Performance into Corrugated Shipping Containers

By

A. O. PARSON

Longview Fibre Co., Longview, Wash.

Quality and performance in corrugated containers are no longer considered problems for board manufacturers alone. New and improved testing equipment and technique definitely has placed the responsibility for quality and performance onto the converter. This responsibility, coupled with more rigid specifications set up by container users and shippers, has forced the converter to become very fabrication-minded. The wise converter watches every operation in his plant; and has installed testing equipment in order to check the effect of each operation on the final performance of his product.

Corrugated containers and combined board are subjected to some 12 different tests. Some tests are set up by the container user, some by shippers and ICC regulations, and still others by the converter himself.

Naturally, the protection of the product within the container is of primary importance; therefore, the ability of the container to withstand rough treatment in shipping and warehousing is determined by the following tests:

1. Mullen
2. Compression
3. Puncture (Inch ounces per tear inch)
4. Crush
5. Drum
6. Drop
7. Score tear
8. Impact
9. Adhesion

There are other tests which do not necessarily measure performance but are important insofar as quality containers are concerned. They are: Weight, Caliper, and Moisture.

It is very important that board rolls themselves be of good quality; also, that the corrugating medium or the .009 should be of moisture content specified, with that moisture evenly distributed across and throughout each roll.

Uneven moisture content in a roll makes that roll very difficult to condition. The dry portion must be treated differently than the wet portion to get uniform flute formations and proper adhesive distribution. Rolls of .009 should be round and tightly wound as flat rolls cause uneven pull, thus resulting in poor flute formation. Caliper of the .009 also must be uniform for good flute formation. Proper density and finish of the sheet are necessary to secure the desired pre-conditioning effect.

Liners must follow along the quality pattern set up for the corrugating medium. Moisture is of primary importance in warp control and adhesion. Rolls should be round and tightly wound for maximum production. Finish is important from the standpoint of not only adhesion, but of scuffing and printing appearance as well. Caliper must be even for good adhesion.

Quality at the corrugator or combiner, the initial machine, is essential, as subsequent operations are very dependent on the kind of board produced on this machine. Good test results also are dependent on the setting and operation of this machine. Compression and flat crush tests results have their origin in flute formation and adhesion.

Uniform flute formation and good adhesion are achieved by proper conditioning, tension, finger settings, adhesive and corrugating roll settings, and the adhesive itself.

By proper conditioning is meant the making of the .009 soft and pliable so that uniform corrugations are formed with the adhesive being applied to all flutes. This conditioning is done by the injection of steam and heat in relationship to the existing condition of the .009. If the .009 is wet, heat with little steam is needed. Nine-point that is too wet or too dry tends to "stick" in the corrugating rolls. Such sticking causes some flutes to not contact the glue roll; and results in skips in adhesion.

Tension, particularly on a .009 roll, must be adjusted to the condition of the roll. Tension, too, affects flute formations as well as distribution of adhesive onto the flutes. Dry rolls normally require more tension than wet rolls.

Finger settings, which probably are the most important settings on a corrugator, must be set and adjusted very carefully. No attempt will be made to describe the correct setting of fingers as existing conditions will alter the settings. Once the correct setting is achieved, no changes should be made until all other adjustments fail to produce results. Improper finger settings will result in dry streaks having no adhesion, in heavy finger lines—the most common cause of failure in compression tests—and in badly formed or damaged flutes.

Adhesive rolls must be set to give even distribution of adhesive with just enough adhesive applied to produce the bond required. Also, care must be used to prevent the building up of adhesive on the corrugating roll.

Corrugating rolls once set should require very little adjusting. Rolls however, should be kept clean and free of all foreign material. Steam pressure within the rolls must be maintained high enough to insure good flute formation. Syphons for ridding the rolls of water must be adequate and in good working order.

Cold corrugating rolls are often responsible not only for poor flute formation but for poor adhesion as well. The .009 has a tendency to "stick" to cold rolls and will not fluff out to contact the glue roll.

Flute contour of the rolls is also important in crush tests. Much work is being done to establish a contour which will produce the highest possible test.

Two types of adhesives are used on corrugators; namely, silicate and starch. Both types have their respective merits, silicate generally being considered superior for producing high crush and compression test. Starch, on the other hand, has the advantage insofar as moisture conditions are concerned. A container subjected to high moisture conditions in use and in storage tends to hold its rigidity better if starch has been used.

On pressure-type corrugators, one other setting, that of the pressure roll, is of primary importance. It is at this point that the .009 is contacted by the top or inside liner. As the contact is a fraction of a second in duration, pressure must be severe in order to achieve setting of the adhesive. However, excessive pressure, or uneven pressure, will fracture or cut the liner and the .009, resulting in a lowering of almost all tests to which the combined board and containers are subjected.

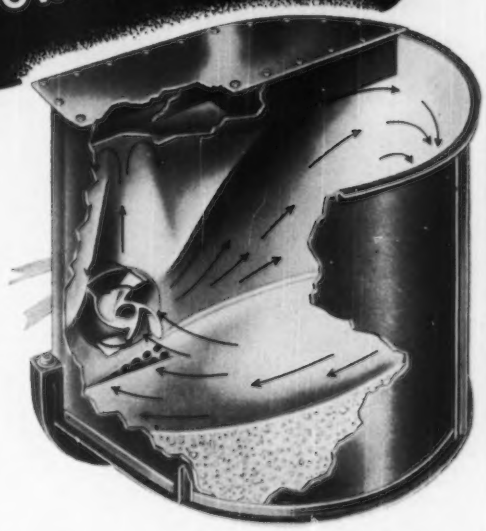
Board combined at the pressure roll point is known as single-face. Such board, as it passes to the next operation, the double back glue station, must be watched closely. The sheet must pass over and under guides and rolls which will tilt or crush the corrugations if care is not used.

Presented before the Joint Meeting of the Pacific Section of the Technical Assn. of the Pulp and Paper Industry and the Pacific Coast Division of the American Pulp and Paper Mill Superintendents Assn., at Longview, Wash.

NOW THE NEW...

Cowles PULPER

BETTER, FASTER, LOWER IN COST WITH GREATLY REDUCED POWER INPUT



May Be Used Continuously or for Batch Pulping of Clean Stock

At last, a pulper that gives you the features you've always wanted. Truly revolutionary in its application of tried and proved pulping principles, the Cowles Pulper achieves efficiency and economy unsurpassed by anything else on the market.

Yet, it is more compact . . . demands far less head room . . . imposes greatly reduced floor loads: Savings that are achieved through elimination of costly and power consuming gearing. The result . . . a lower-priced pulper with a cost-saving drop in power input.

The side-drive design of the machine permits circulation of high consistencies with relatively small high-speed impellers . . . hence, sharply reduces the cost of the impeller and drive mechanism. A steeply-sloped bottom facilitates rapid drainage and will handle batches from ⅓-size to full-size with equal efficiency. There is virtually no splash at any operating level. Submergence is excellent at all levels and consistencies.

Like all Cowles equipment, Cowles Pulpers are soundly engineered and ruggedly constructed for long, trouble-free service. They embody proved hydraulic principles that yield high output with low power consumption. Write or wire for complete details.

The Cowles Company
INCORPORATED
1010 Trackside Cayuga, New York
Associates: Alexander Fleck, Ltd., Ottawa, Ont.

At the glue station, as the adhesive is being applied, the setting of the rider roll should be just heavy enough to cause the flutes to come in contact with the glue roll. The flutes should not be crushed or knocked down. The liner, the bottom or outer liner, applied here, must be unwound with proper tension to prevent end warp.

Preheaters at the glue station for both the liner and single-faced sheet are important in warp control. The platens, or drying section of the corrugating unit, must be of sufficient length and heating capacity to properly set the adhesive.

Platens over which the combined sheet travels must be kept smooth and clean to prevent scuffing or marking of the board. Also, belts which hold the board on the platens and pull the sheet through the machine must be uniform in thickness. Such belts are required in order to properly force the single-faced sheet onto the bottom liner so that all flutes come in contact with that liner and are held there until the glue is set.

It is at the glue station that the "hi-lo" flutes show up, with the "hi" flutes only, adhering to the bottom liner. These skips in adhesion materially lower the compression test, particularly if the skips are near scores or corners of a container.

As the combined board emerges from the double-facer, another cycle of fabrication is entered into, that of slitting and flap scoring. If slitter knives are kept sharp and properly set, clean edges are no problem. Scores of correct profile, properly set, are very important in achieving high top to bottom compression test at low deflection. Male and female scores must be in perfect alignment to prevent cutting.

The cut-off knife does not enter into any test problems. The sheets, however, must be of correct length and free from variation to best meet the requirements of the operations to follow. Also, pull rolls ahead of the cut-off knife, must be counterweighted to prevent crushing of the flutes.

The final operation of the combining machine, which is the taking off and stacking of the blanks, also can affect quality and performance. Rough handling, at times, will break the adhesive bond, mark the sheets, and, in extreme cases, crush the corrugations. Poor stacking, with edges and ends not straight, causes warp and poor adhesion. Tiers of blanks piled too closely together do not allow for ventilation; consequently, if loads are subjected to a cool atmosphere, sweating occurs and the adhesive bond is broken. Every other handful of blanks must be turned over as it is stacked to prevent warping.

In order of fabricating sequence, corrugated blanks next are taken to the printer slotters where they are printed, scored and slotted. It is to this operation that many test failures can be traced. Another very important phase of quality, that of appearance, enters the picture here. Container users long since learned the value of advertising; and they see in a printed container a traveling billboard. Therefore, the appearance of the printing as to colors, cleanliness, and appeal is very important.

Quality printing is contingent on impression, register, and ink coverage. Enough impression must be applied to prevent smear and offset, but not enough to crush the corrugations to a point that poor test results are obtained. To obtain register, it is necessary to hold the blanks securely as they pass between the feed rolls and pull rolls. The setting of these rolls must be correct to prevent slipping and crushing. Ink coverage, while not affecting performance, does affect appearance. The adjustment of ink rolls and ink flow is very important.

Correct choice of printing dies aids materially in achieving all requisites for good printing. Hardness of the dies must be of proper durometer to accomplish good coverage without excessive impression.

Aside from actual printing on the printer slotter, the scoring and slotting done in this operation require their individual share of attention. Scores here too, must be of proper profile; and set to insure a good square fold, yet not cutting the liner. The top score must be centered with the bottom score to prevent folding erratically. Dimensions as to the box size must be checked carefully to assure a good fit of the contents for which the container is made. Slotting must be done with sharp knives to prevent ragged edges. The top and bottom slotter heads must be set close enough together to hold the blank firmly between slots, being very careful to prevent crushing.

After the container has passed through the printer slotter and sufficient time allowed for ink drying, it enters into the final step of fabrication, that of joining, either by taping or stitching the joint.

With the advent of modern automatic equipment for joining, chance for damage at this point has increased. Folding equipment for either tapers or stitchers makes it necessary for the blanks to pass between feed and pull rolls — always a crushing menace. Folding and squaring devices must be watched and set carefully to prevent damage.

Taping machines proper have their own damage points, such as crushing at pull rolls and conveyor belts. The conveyor belts probably are guilty of more crushing than any other part of the tape machine. Setting the top belt down onto the lower belt often overcomes such taping faults as slippage, poor adhesion and variation in tape application. In some cases, however, crushing continues to occur. So this practice must be supervised closely.

Stitchers have their share of pull rolls which must be adjusted properly to prevent damage. Correct spacing and clinching of the stitches will assure a good secure joint.

As the joining process is the last step in the fabrication of containers, inspection at this point should be very thorough. Employes working in this department should be well trained on quality consciousness and should have instructions to discard or call attention to any imperfections discovered.

The fabricating processes discussed do not entirely cover the field of container manufacture. They are, however, the primary steps affecting quality and performance. The converter who will take the time and precautions necessary to achieve this quality and performance, will find himself well established with his customers.

Buffalo Envelope Expands

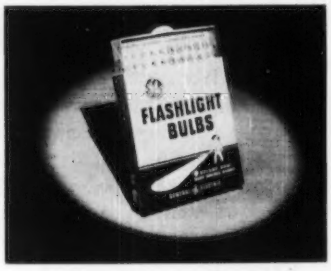
BUFFALO, N. Y.—An expansion program for the 80-year old Buffalo Envelope Co. was announced by Laurence G. Reineman, president. It will cost more than $100,000.

The company will erect a three-story addition to its 270 Michigan Avenue headquarters. It is scheduled to be started this Spring and completed in the Summer.

Constructed of concrete and steel, the addition will be used for manufacturing and storage. Mr. Reineman, who has headed the company for more than 20 years, estimated the addition will increase total space about 20 percent to more than 100,000 square feet. The expansion not only will increase production but will mean a slight increase in employment. The company employs about 200 workers. It produces more than 3,000,000 envelopes daily on a one-shift basis.

Gair Makes Lamp Bulb Dispenser

NEW YORK—An unusual and dramatic dispenser-type display container has been manufactured for the lamp department of General Electric Co. at the Cleveland Cartons plant of Robert Gair Co., Inc., manufacturers of paperboard, folding cartons and shipping containers.



Merchandising of assorted size flashlight bulbs is aided by the novel construction of this Tuf-Bord carton which contains a rigid tray with drawer pull. An easel back on the

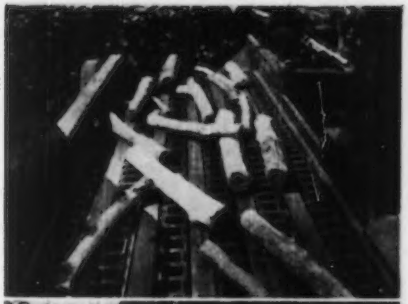
(Continued on page 44)

HANDLING *All the Way*
Pulpwood to Paper

The Pulp and Paper Industry is just one in which the diversified line of Jeffrey equipment meets practically all handling requirements. There is a proved unit to handle it economically and to your complete satisfaction . . . whether its pulpwood, rags, chips, lime, sulphur, straw, salt cake, paper rolls, packages of paper or board . . . as well as shredders and pulverizers for reducing material to a uniform product.

Belt Conveyors
Chip Conveyors
Chain Conveyors
Crushers (salt cake)
Elevators (bucket)
Feeders

Log Haul-ups
Re-chippers
Chains
Unloaders (barge)
Transmission Machinery



Photos show various applications of Jeffrey Material Handling Equipment handling chips and pulpwood. Whether from barges, yard storage or railroad cars Jeffrey Belt and Chain Conveyors take it away as fast as it comes.

Note the heavy type chain in the top installation view. This chain is built to take the severe punishment of falling pulpwood day after day. Chain was our earliest product. We know how to make it exceptionally well.

THE JEFFREY
MANUFACTURING COMPANY Established 1877
931 North Fourth St., Columbus 16, Ohio

Complete Line of Material Handling, Processing and Mining Equipment

JM

Baltimore 2 · Birmingham 3 · Boston 16 · Buffalo 2 · Chicago 1 · Cincinnati 2 · Cleveland 13 · Denver 2 · Detroit 13 · Harlan · Houston 5 · Huntington 19 · Jacksonville 2 · Milwaukee 2 · New York 7 · Philadelphia 3 · Pittsburgh 22 · St. Louis 1 · Salt Lake City 1 · Scranton 3

ASSOCIATIONS

Truck Loggers Convention

VANCOUVER, B. C.—With over 1100 attending the final banquet and dance, and over 100 member firms registered, the Truck Loggers' Assn., has completed its seventh annual convention at Vancouver, B. C., and achieved the reputation of staging the largest industrial gathering in the province. The convention concluded with a banquet and dance, which overflowed both the ball room and banquet hall of the Hotel Vancouver, necessitating extra accommodation being set up in three other rooms. Honourable Byron I. Johnson, Premier of British Columbia, speaking at the banquet, said British Columbia must do all she could to maintain her position in trade and to cultivate the English market. He estimated that the development of greater buying in British Columbia of British products can mean a difference of 30 to 50 million dollars in trade from B. C. to Britain.

Honourable E. T. Kenney, Minister of Lands and Forests, speaking at the banquet, made a strong plea for reforestation and conservation. He said timber was one of the natural resources which, if properly controlled and managed, would not be depleted, but could be made a perpetual source of wealth.

One of the most interesting features of the convention was a discussion on "The Art of Living and Working Together." Honourable Capt. John M. Cates, Minister of Labour for British Columbia, acted as chairman. The subject was introduced in a paper by Ralph D. Baker, president and managing director, Standard Oil Co. of B. C. Ltd., which was read in his absence due to illness. James Fadling, president, International Woodworkers of America, came up from Portland to present the situation from the standpoint of labour, while Robert J. Filberg, first vice-president and vice-chairman of the Board of Directors of the Canadian Western Lumber Co. Ltd., dealt with "The Employer's Viewpoint." Capt. Cates asked for harmony and understanding between labour and management. Mr. Baker made the point that freedom cannot be absolute, but that the majority has yet to be convinced that we cannot have something for nothing and personal freedom too. He said it would seem that those who are concerned with the principles and methods involved in the art of living and working together should extend their thinking in order to achieve this accomplishment without compulsion. Mr. Fadling said labour was asking nothing from capital that a sincere effort on the part of employers to work out day-by-day problems through ordinary collective bargaining could not accomplish. Mr. Filberg, replying to a statement by Mr. Fadling, that unions were here to stay, made the point that loggers were also here to stay and that unless there was a cooperative approach to a common problem tilts between labour and union would be inevitable.

E. F. Stamm, general manager of Logging Operations in the Columbia River Basin for the Crown Zellerbach Corp., Portland, spoke on "Closer Utilization and Better Forest Management." He said waste in the Pacific Coast forests might be estimated at as high a figure as 4,500,000,000 feet per year in the Douglas Fir areas of the United States. On the basis of these findings by Mr. Stamm, the waste in British Columbia may be estimated at 1,500,000,000 board feet annually.

John Liersch, Assistant Vice-President, Powell River Co. Ltd., Powell River, B. C., said his company had successfully relogged an operation, taking 4,000 cords from slash, hauling it 200 miles to the mill, and it made a profit of $4,000. Cost at the mill, he said, was about the same as logs bought on the open market, but the big advantage was that relogging had greatly reduced the fire hazard in the area and left it in a much better shape for regeneration. Even where an operator only broke even, relogging or salvage operations were valuable from the latter standpoint, he contended.

"Value of the Skyhook" in logging operations was discussed in an address by J. H. Kelsey, Kelsey-Johnson Ltd., Vancouver, while Henry Dennis, logging manager, Soundview Pulp and Paper Co., Everett, Washington, discussed "Improved Logging Methods." Other speakers included A. L. Smith, B.C., K.C., M.P., Calgary, and The Very Reverend Cecil Swanson, D.D., Dean and Rector, Christ Church Cathedral, Vancouver, who addressed the two luncheon meetings of the group.

One of the interesting features of the convention was the importation into the dignified ball room of the Hotel Vancouver of all the paraphernalia of a backwoods snack. Logging camp cooks and waiters in white aprons and shirt sleeves served the convention delegates with sausages wrapped in hot cakes and steaming mugs of coffee during a bull session on the morning of the second day.

Social functions were an outstanding success and were arranged through the co-operation of the machinery delegates serving the industry in British Columbia, with John E. Usborne, Harold O. Hall, and R. B. Lucas handling arrangements. General planning of the convention was carried out by G. Harold Clarke, president, and Fred H. Adams, secretary.

Mr. Clark of Chilliwack was re-elected as president of the association. D. M. MacKenzie, logging operator, truck fleet owner and holder of royalties on the magnetic rising gate used on leading courses at the Coast, was named vice-president, winning by a very small margin of votes from J. W. Baikie, who held that post last year. Directors of the association for the ensuing year are C. C. Smith, E. Gibson, H. J. Welch, M.L.A., G. E. Wellburn, S. J. Dumaresq, O. A. Buck, L. A. Moloney, J. W. Baikie, J. Allison, H. McQuillan, J. E. Fletcher, and A. Bendickson.

A change in the by-laws of the association removes the post of secretary from the election, and in future this appointment will be made by the directors. Mr. Adams is continuing in the secretarial position.

Maine Luncheon At Roosevelt

ORONO, Me. — The University of Maine Pulp and Paper Alumni luncheon to be held in New York, February 22 at 12:30 p.m., is now scheduled to take place in the Small Ballroom at the Roosevelt instead of the South Room at the Commodore. The change in the location of the meeting was made necessary by the large number of responses to the announcement of the luncheon.

N.P.T.A. Conducts Cost Studies

NEW YORK—Members of the National Paper Trade Assn. staff have expanded the territorial scope of their program for informing paper merchants as to their individual costs of doing business in the various trading areas by means of analytical surveys.

Stanley O. Styles, assistant secretary, recently returned from a trip during which he spoke on this subject to groups of members in Indianapolis, Toledo and St. Louis.

W. G. Leathers, executive secretary, and John E. Goodridge, assistant secretary, spoke at recent meetings of the Pittsburgh Paper Association, the Chicago Paper Association, and at the Mid-West Paper Merchants Regional meeting in Chicago. Mr. Goodridge also spoke to Columbus and Cincinnati members on this subject.

Messrs. J. Harry Londergan, director of statistical research, and Mr. Goodridge also attended the annual meeting on January 20th of the Southeastern Paper Trade Association in Richmond, Va., at which Mr. Londergan presented the results of Cost Studies made in this area.

New Members Drive

The Forest Products Research Society, a relatively young organization, has grown to an active membership of 2300 within the past three years. Its function is to bring together men interested in all forest products including lumber utilization, pulp and paper and by-products, for the technical betterment of this major industry.

Anyone interested may obtain details from the headquarters, Box 2010, University Station, Madison, Wis.

Kingerly Addresses TAPPI

KALAMAZOO, Mich.—Dr. Richard W. Kingerly of E. I. du Pont de Nemours and Co. spoke February 2 to the Kalamazoo Valley Section of TAPPI on the subject of "Biological and Pest Control for the Paper Industry." Dr. Stephen I. Kukolich, Lee Paper Co., Vicksburg, presided.

Dividing his presentation into three themes, Dr. Kingerly outlined the need for a safe and effective insect repellent to incorporate in paper and paper board and spoke of research aimed at developing such a product. He told of efforts, so far unsuccessful, to find a similar repellent for rodents, both measures needed to prevent insects and rodents from damaging products packed in paper containers. He further dealt with the controlling of slime growth so that slime spots will not develop from loosened slime colonies getting into the finished product.

Members of a panel discussion which followed the session were: Dr. H. O. Wiles, Sutherland Paper Co.; Dr. James Harrison, Michigan Carton Co., Battle Creek; H. R. Hall, Allied Paper Mills; Dr. G. F. Des Autels, Kalamazoo Vegetable Parchment Co.; and K. A. Wyatt, du Pont de Nemours & Co.

Lake Erie Group To Discuss Adhesives

CLEVELAND, Ohio — The subject of "What's New in Adhesives" will be brought out by a three man panel representing three major adhesive companies, each one providing a twenty minute talk.

The first panel discussion will be on envelopes, set-up and folding box adhesives by a representative of Federal Adhesives Co. A representative of Corn Products Sales Corp. will present the second panel discussion on gums for bags and tubes. The third panel discussion will be on Adhesive Specialties for film, foil, and etc. by a representative of National Starch Products.

This sixth meeting of Lake Erie Papermaker's and Converter's Assn. will be held March 17 at the Hickory Grill, 929 Chester Avenue, Cleveland, Ohio. Cocktails will be served from 6 P.M. to 7 P.M., dinner at 7:15 P.M. and the meeting will be opened promptly at 8:15 P.M. Reservations and requests for further informtaion should be addressed to W. Schoenberg, Sec-Treas. LEPCA, Room 105, 1200 West 9th street, Cleveland 13, Ohio.

Superintendents Div. Reps. Selected

CHICAGO—Ten members of the Affiliates group of The American Pulp and Paper Mill Superintendents Assn., Inc., are now assisting the various divisions in the preparation of programs and entertainment. These men were appointed by the Affiliates committee after consultation with the national and divisional officers.

This new cooperative endeavor was approved by the directors of the association during the convention in Atlantic City last June. The primary purpose is to make worthwhile use of the ideas and services of affiliates in conducting interesting, informative divisional and national meetings.

The divisional Affiliate representatives are: Connecticut: Ray Kilty, A. E. Stanley Manufacturing Co.; Miami Valley: Norman Scott, Orr Felt and Blanket Co.; Michigan: C. B. Smith, Noble and Wood Machine Co.; New York-Canadian: H. A. Horstmann, General Dyestuff Corp.; Northeastern: D. M. Hall, Eastwood-Neally Corp.; Northwestern: C. O. Collipp, Simonds Worden White Co.; Pacific Coast: R. B. Morden, Morden Machine Co.; Pennsylvania-New Jersey-Delaware: W. B. Morehouse, Nopco Chemical Co.; Southeastern: Harry Hulmas, Williams-Gray Co.; Southern: Vernon Woodside, Mathieson Chemical Corp. They will be glad to receive suggestions from members of the Industrial Affiliates group.

New England Tappi Meeting

HOLYOKE, Mass.—The New England Section of TAPPI held its January meeting on the 20th at the Hotel Northampton, Northampton, Mass.

Robert H. Mosher conducted the meeting which was devoted to paper lamination. The various aspects of this problem; namely, machinery, theory of adhesion and the aspects of technical service were developed by a panel of five speakers. 120 people were in attendance.

The first speaker, Lawrence W. Egan of Frank W. Egan & Co., discussed "Machinery for Laminating Paper and Paper Board." Mr. Egan extemporaneously discussed various types of laminators for various types of laminations.

Dr. Frank C. Campins of Polymer Industries, Inc., discussed "The Theory of Adhesives." He stressed the importance of greater laminating speeds and higher quality.

Al Berk of Paisley Products, Inc., discussed "Water Soluble Specialty Paper Laminants." This embraced starch, casein and animal glue.

"Special Adhesives for Film and Foil Laminates" was discussed by William Sederlund of National Adhesives Div. of National Starch Products, Inc. The differences between paper and film and foil laminations were cited.

Herbert Wells of American Resinous Chemicals Co. read a paper prepared by J. J. Austin of Austin Industries. The title of the paper was "Information Necessary For Technical Service On Adhesives."

Washington's Quality Control Course

ST. LOUIS, Mo. — Washington University will again present its annual industrial quality control course April 17-29 offering advanced training in management technique. Particular emphasis will be given to methods useful in applications to the chemical, paper, leather, ceramic, foundry, rubber and other process industries.

E. R. Leonard Reelected

At the annual meeting of the Vegetable Parchment Manufacturers Assn., E. R. Leonard, vice-president of Patterson Parchment Co., was reelected as chairman. Mr. Leonard, at this meeting, pointed out that the vegetable parchment manufacturers had had a reasonably good year in 1949 and looked forward to continued good business in 1950. He reminded members, however, that the import duty on vegetable parchment was now one-third of what it was several years ago and that, in addition, foreign currencies had been devalued by 30 percent. In addition, costs of labor and many materials used in paper-making had increased so that manufacturers faced a period when close cooperation between the sales and manufacturing departments was essential, and when the productivity of labor must be maintained at its greatest efficiency.

Avery Heads Supply Association

SPRINGFIELD, Mass. — Clarence W. "Gus" Avery, sales manager of the Springfield Paper Stock Corp., was elected president of the Eastern Paper Mill Supply Assn. at the organization's annual meeting and election of officers in Boston January 26.

Mr. Avery, who is well known throughout the paper mill trade, had been serving as acting secretary of the association, which enjoys a membership of 40 concerns throughout the New England area.

The next meeting of the group will also be in Boston, followed by a gathering in Springfield the following month.

Southern Forestry Conference

JACKSONVILLE, Fla.—Sponsored by the Forest Farmers Assn., the Southern Forestry Conference will be held here February 17-18. "Prosperity from Growing Trees" will be the theme of the conference, according to W. M. Oettmeier, president of the group.

An example of Salmonella Typhosa Bacteria, magnified 30,000X by Electron Microscope.

Are Bacteria Biting Into Your Profits?

During many production stages from the raw stock to the finished product, bacteria and mold are an ever present threat to the paper industry. These microorganisms cause mildew on lap stock, "sour" pulp slush, and attack glues, making them lose adhesive strength.

Such attacks cost time and money and result in shrinking profits. Like many leading paper mills, you can prevent these costly wastes with Dowicides. Dowicides, Dow's industrial germicides and fungicides, provide proper microbial and mold control. They will help eliminate souring and spoilage.

Don't let bacteria and mold bite into your profits. Investigate Dowicides today. Dow maintains extensive laboratory facilities to help you with your problem. Contact your nearest sales office or write direct.

THE DOW CHEMICAL COMPANY · MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Atlanta
Cleveland • Detroit • Chicago • St. Louis • Houston
San Francisco • Los Angeles • Seattle
Dow Chemical of Canada, Limited, Toronto, Canada

use the

Dowicides

Industrial Germicides and Fungicides

DOW
CHEMICALS
INDISPENSABLE TO INDUSTRY AND AGRICULTURE

Analysis of Pulp & Paper Industry and the Raw Material Supply

By Klaus G. Scheye

Mr. Scheye is a Canadian, graduate of Queen's University in 1940. He has been employed as engineer trainee in nickel smelting and gold mining. Since graduation, he worked for Stadler, Hurter & Co. and Howard Smith Paper Mills of Montreal. Two years ago he entered Columbia University receiving his M.B.A. this month. The following series of articles are based on his recent studies.

Introduction

The pulp and paper industry, in spite of being one of the largest industries in the United States, has never received much attention from students of economics, business or finance.

There are several good reasons for this. The industry is very old. The industry never went through a period of spectacular growth like the automobile industry, nor was it subject to the consolidations and mergers that put the steel industry into the limelight.

However, the situation has now changed. Both the associations active in the field, and the government have brought out many excellent statistical series dealing with production, employment, export, import and prices.

A study of these statistics indicates that vast changes have occurred in recent years, contributing greatly to the expansion and geographic shift of the paper industry. The greatest single factor, contributing to this change, has been the raw material situation.

Over many years, a scarcity of forest products has been developing in America. This scarcity, together with new technical developments in the pulping of wood has brought about vast geographic changes in the location of the industry and the nature of the final product.

Part 1
The Raw Material Situation

This report will deal with the shortage of raw materials to the pulp and paper industries. Part I is a summery of the raw materials situation in the United States and Canada. A brief report on the world pulp situation is included to complete the picture. Part II deals with the consequences to the industry of the shortage of raw materials. The questions of geographic location, integration and size of the individual enterprises are discussed in some detail. Part III deals for the most part with the future of the industry and briefly examines some of the technical developments that point into the future.

Since data from the Bureau of Census (1947) is used frequently, the Census definitions are given below.

Pulp Mills (Std. Industrial Classification No. 2611): This industry comprises establishments primarily engaged in manufacturing pulp from wood or from other materials, such as rags, linters, waste paper, and straw.

Paper and Board Mills (Std. Industrial Classification No. 2612 and 2613): This industry comprises establishments primarily engaged in the manufacture of paper, paperboard, building paper and building board from wood pulp, and other fibers on a standard or modified paper machine.

This report will talk mainly about "The Industry," and this term will include both the pulp and paper industry. However, it should be remembered that there are numerous industries, depending upon the types of paper or pulp turned out. In some cases, these separate industries also operate in different markets. In other cases, they compete, and grade shifting is frequent. Essentially, however, all these branches of the industry have one thing in common: their raw material, wood.

Chapter I
World Pulp Situation[1]

The raw materials of the paper and pulp industry are found mostly in the Northern Hemisphere. The United States, Canada, Northern Europe and Northern Russia, and the northermost islands of Japan grow most of the softwood stands of the world. Only in very recent times, have attempts been made to utilize the hardwoods of the warmer zones and to tap the riches of the tropical forests.[2]

From figures[3] available for 1937, it

[1] Food and Agriculture Organization of the United Nations Report of the Preparatory Conference on World Pulp Problems. Canadian Pulp and Paper Assoc., Montreal, Canada, June 1949.
[2] *Ibid.*, p. 39.
[3] Tables 5, 7, 8.

TABLE 5

World Minimum Pulpwood Requirements and Supplies

(Thousands of cubic meters solid volume)

(1955 Estimate)

Region	Consumption	Cut	Net Trade Export (+) Import (—)
Europe	47,975	44,400	(—) 3,575
North America			
Canada	28,249	31,798	(+) 3,549
U. S. A.	64,856	59,872	(—) 4,984
Total	93,105	91,670	(—) 1,435
Asia	3,400	1,800	(—) 1,600
Oceania	1,085	1,085	(—) ----
Grand Total	145,565	138,955	(—) 6,610

Source: Report of the Preparatory Conference on World Pulp Problems, Canadian Pulp and Paper Association, Montreal, Canada, June 1949.

appears that Europe produced 49 per cent of the world's wood pulp supply, while it consumed only 42 per cent. The balance was mostly exported to America, which in the same year consumed 51 per cent of the world's wood pulp, and only produced 46 per cent.

The Near East, Africa, Latin America and Oceania had negligible production and consumption figures. Only Asia was of some importance: in 1937, it consumed 6 per cent and produced 5 per cent of the total world wood pulp. The countries with a surplus in Europe, mostly Finland and Sweden, exported their pulp to the United States, South America and small quantities to areas of lesser importance.

Pulpwood, the product straight out of the forest, was of no major importance in intercontinental world trade, mostly due to the high transportation cost involved. Between adjacent countries on the same continent, however, the trade in pulpwood was of some considerable importance. Thus the Scandinavian and Eastern European countries exported pulpwood to other European countries with short timber supplies, and large quantities were exported from Canada to the United States. Only Russia from time to time sent shipments of pulpwood to America.[3]

"As will be seen from the geographic location of the countries with softwood supplies, they are all in areas deeply affected by the recent war. Several of the Baltic nations were incorporated into the USSR and their rich timber resources were lost to the world trade. Similarly, Russia took over large areas of timberland in Finland and Poland. The economy of Scandinavia was greatly disrupted by the war. Even though Sweden did not take an active part in the fighting, it was cut off from the world trade and had to overcut its timberlands to make up for the lack of imports of coal, gasoline, textiles and animal feed, by utilizing the forest products. The government-supervised forestry operations of Sweden had to be curtailed with the end of hostilities in order to allow the forest to return to a sustained yield basis.[4]

The economies of Central Europe were even more interrupted, and the forests overcut. In addition to the actual damage of war, the financial crises of the European countries added to their difficulties. While the Scandinavian countries could offer pulp at competitive prices in New York before the war, their overvalued currencies and high labor costs made it difficult to do so after the war. On the other side of the earth, Japan, due to its loss of forest lands to Russia and an inability to pay for imports, was unable to meet its own post-war requirements.

In contrast to the difficult situation in other countries, North America greatly increased its need for wood pulp because of the wartime research that uncovered many more uses for paper products and produced many new products. As a result, in 1948 the United States consumed 70 per cent and produced 68 per cent of the world wood pulp, while Europe consumed 25 per cent and produced 29 per cent. Moreover, other industries in addition to pulp and paper, are competing in the postwar world for a share of the forest resources. The great postwar building booms, the growing use of rayon (for which pulp is a raw material), building papers and new plastic products have taken an increasing toll of the wood pulp available in the world.

In April, 1949, The Food and Agriculture Organization of the United Nations held a conference in Montreal, Canada, to discuss world pulp problems. As a result, the conference arrived at a number of conclusions and forecasts for 1955:[5][6]

The Conference finds that effective demand for products using wood pulp is much greater than present consumption would indicate, due to the financial difficulties between the sterling and dollar areas and the low standard of living in many countries. In spite of the fact that the 1948 pulp production was the highest in history, there was available idle capacity in Europe and Asia (principally Japan), sufficient to produce 5.3 million tons of pulp.

Nevertheless, in view of the new producing capacity in North America and the possible decline in economic activity in the USA, the conference foresaw an approximate balance between supply and demand from 1949 through 1955.[6] In the short run, a net deficit of pulp is anticipated for 1950, with the total world requirements showing a slight shift in percentage distribution. In the United States, there may be a decline, while European needs may expand more rapidly than production. Moreover, to earn dollars, European exports will be directed to the USA rather than to the nearer European markets. The conference took a serious view of the increasing rayon needs, especially where pulp now available to the paper industry is diverted to the more profitable dissolving pulp production for the rayon industry.

Since the conclusions of the Conference have been published, many countries have devalued their currencies in relation to the dollar. This may mean that many countries which, due to financial difficulties could not obtain pulp supplies previously, will now be able to do so. Canadian and Scandinavian pulp compete in many areas of the world. With the Sterling Block countries unable to pay for Canadian pulp in dollars, they will more and more turn to Scandinavia for their supply.

Russia's pulp capacity is an unknown factor. The rivers of Russia in the softwood country drain into the icebound Arctic. Russian home needs may actually be very great, due to the increased literacy in the country, and the development of backward areas. One press report states that Russia is planning 40 new paper mills.[7] Should the Russians for political and monetary reasons decide to export, however, they could easily upset the whole world market.

Another possibility from the long-range point of view is the higher utilization of sawmill waste, increased use of hardwoods and other raw materials, such as straw, and the diversion of timber from other uses to the production of wood pulp. Experiments in all these areas have been conducted in many countries, notably in Europe, for many years; and some of the research may bear full fruit in the next few years.

However, from the point of view of the American paper and pulp industry, the conclusion seems to be that over the long run, not much pulp imports can be expected from outside of North America itself. Moreover, the overseas shipments would be cut off completely in case of a war. Even in peacetime, European supplies are variable, both as to quantity and cost. The various governments may control the pulp industry, by exerting political and financial pressures that may disrupt smooth commercial relations. As a consequence, U. S. manufacturers

[3] Stevenson, L. T. Background and Economics of American Papermaking. New York and London, Harper and Brothers, 1940. p. 204.

[4] Glesinger, E. The Coming Age of Wood. New York, Simon and Schuster, p. 41-49, 1947.

[5] *Op. cit.*, F. A. O. Report of Preparatory Conference p. 7.

[6] See 1955 Estimates, Tables 5, 6, 7, 8.

[7] *Ibid.*, p. 10.

[8] *Paper Trade Journal*, Jan. 1, 1948, p. 18.

should look primarily to this condinent for a major part of their supplies. Hence it seems well to discuss at some detail the raw material situation in both Canada and the USA.

In discussing the supply of raw materials to the United States pulp and paper industry, it is necessary to take into account not only the extent of the Canadian forest resources, but also the public policies of the Dominion and Provincial governments and the requirements of the domestic pulp and paper industry. It is necessary to discuss public policies primarily, because, unlike in the United States, the Canadian provincial governments have largely retained ownership of the forests. Of the productive and accessible forest land, 72 per cent is held by the provincial governments as Crown lands.

Since a large part of the Canadian wood harvest is utilized in the manufacture of wood pulp and newsprint which is exported to the United States, the Canadian raw material supply forms an integral part of the raw material resources of North America. Moreover, in recent years, first on account of the war and later due to the dollar situation, Canadian exports of pulp and paper to countries other than the United States have been very small, and this trend is likely to continue.

CHAPTER II

Canadian Resources*

The role of the Provincial Governments in controlling the pulp and paper industry in Canada is well discussed by Guthrie in "The Newsprint Paper Industry."[1] In a survey[2] of the major provinces with timberlands, i.e. Ontario, Quebec and British Columbia, he found that as a rule timberlands were disposed of by public auction with the government setting a lower limit, the "upset" price and the bidding starting beyond that.

Grants are made for a period of 21 years and are renewable at the option of the government for a further 21 years. The timber holders pay both a fixed annual charge and a sum depending on the cut. The agreements are specific as to the type of timber that can be cut, the size limit of the timber, and the dues that must be paid.

It is in the power of the Provinces to change the fees from time to time, and this has been done frequently, especially in Quebec. To some extent, these fees vary with market conditions and have some bearing on the final price charged to the American importer. From the agreement[3] between the Province of Ontario and the Abitibi Power and Paper Company, dated March 29, 1946, the following typical figures are extracted:

"The Company shall pay to the Treasurer of the Province of Ontario the following prices:

(a) for pulpwood cut on Concession Area, the following:—

Spruce	$1.65 per cord
Balsam	.75 per cord
Jackpine	.50 per cord

ines. of Crown Dues

(b) for timber cut on Concession Area for purposes other than for pulpwood: such prices as the Minister may from time to time determine, to be consistent with prices on adjacent or similarly situated concession areas.

The above prices shall be subject only to such variations in Crown dues as may hereafter be generally effected by regulation for timber cut for domestic manufacture and applicable throughout the Province of Ontario."

The company pays $6.40 per square mile for fire protection and $5.00 per square mile for ground rent, annually.

There being no proper inventory of the forest resources available, the companies are required to provide the minister with a so-called management plan, showing inventory and the proposed cut by land areas within the concession. Such plans must be approved before they can become operative. The companies in their reports refer to their practice of *sustained yield cutting*. However, all that is meant by that term is that the companies practice selective cutting under these management plans; it does not mean *sustained yield cutting* as the term is understood by the professional forester. It is true in most cases, that the paper companies cut in such a manner that they are assured of a perpetual supply of timber from these limits.

In spite of this control by the government over the timber resources of the country, vast areas of Canada have in the past been subjected to destructive timber cutting just about in the same manner as the United States forests. The Royal Commission reporting on the affairs of the Abitibi Power & Paper Company in 1941, at a time when the company was still in the courts under receivership, had this to say:

> In our view, with the industry in the present position, . . . the day of dispensing favours in the form of timber concessions to new political friends has long gone by, and for some time to come, the problem will be one largely of judicial administration of the raw material requirements of the industry as presently constituted.[4]

Nevertheless, there is ample evidence, even today, that politics play a vital part in the Provincial timber granting methods.

There have been instances in the past where the provincial governments tried to enforce a uniform price policy, by threatening reprisals in the form of increased dues to companies that did not follow established industry practice.[5] That threat is still present today.

At the end of hostilities, two of the main timber-rich provinces, Ontario and British Columbia, appointed Royal Commissions to deal with the forestry situation. From these reports, the impression can be gained that provincial forestry policy in the future will be put on a scientifically sound basis that will assure a continued supply of timber to the various industries, using forest resources as their raw material. According to the official Handbook, "Canada 1947," British Columbia owned 19 per cent and Ontario 30 per cent of the total Canadian accessible and productive forestry area.[6] With regard to trees large enough ot be valuable as saw timber, British Columbia holds 44 per cent and Ontario 22 per cent of the total Canadian supply. In Ontario, 79 per cent, and in British Columbia 100 per cent of the timber consists of softwood stands that can be used by the paper and pulp industry.

The Howard Kennedy Royal Commission of Ontario[7] reports great waste in the timber cutting operations of sawmill operators and calls for integration of the lumber industries. It is often prohibited for paper companies to cut saw timber or for saw mill operators to cut pulpwood for the mills. Testimony[8] before the Commissioner furthermore accused the government of favouring the paper companies as against the sawmills. The paper companies were accused of reserving for themselves far more timberland than they needed, and cutting logs of a size that might be better utilized by the lumber trades. Political expediency, according to the Commis-

TABLE 6

Dissolving Pulp, Production and Consumption

(Thousands of metric tons)

Region	1937 Production	1937 Consumption	1955 Maximum Production	1955 Maximum Consumption
Europe	490	400	1,160	1,140
North America	400	180	915	715
Latin America	...	5	15	65
South and East Asia	70	430	80	150
Oceania	...	...	5	5
Total	960	1,015	2,170	2,075

Source: Report of the Preparatory Conference on World Pulp Problems, Canadian Pulp and Paper Association, Montreal, Canada, June 1949.

---

* See Tables 9, 10, 11.

[1] Guthrie, J. A. Newsprint Paper Industry. Cambridge, Harvard University Press, 1941.

[2] *Ibid.*, p. 32-36.

[3] Report of the Minister of Lands and Forests of the Province of Ontario, March 31, 1946. Toronto, Printer to the King, 1947, p. 164.

[4] Report of the Royal Commission, Inquiring into Affairs of Abitibi Power and Paper Company, Ltd., Toronto, March 1941.

[5] *Op. cit.*, Guthrie, J. A., pp. 98, 160.

[6] Dominion Bureau of Statistics, The Pulp and Paper Industry in Canada, Official Handbook, Reprint 1947. Ottawa, The King's Printer, 1947.

[7] Kenedy, H. The Royal Commission Report, *Pulp and Paper Magazine of Canada*, Gardenville, Quebec, National Business Publications, Ltd. Sept. 1947, pp. 118-125; Oct. 1947, pp. 106-124.

[8] *Pulp and Paper Magazine of Canada*, Jan. 1947, p. 98.

TABLE 7

World Pulp Balance: Selected Years

(Thousands of metric tons)

Region	1937 Consumption	1937 Production	1948 Consumption	1948 Production	1955 Requirements	1955 Production
Europe	9,900	11,590	7,000	8,050	11,800	11,100
U. S. S. R.	....	145*	....	40	....	200
Near East and North Africa	15	5	15	10	30	30
Latin America	245	25	470	190	685	440
North America	12,030	10,590	19,255	19,010	23,705**	23,915**
Africa	..	....	15	15	40	30
Asia	1,525	1,180	520	505	925	880
Oceania	50	....	200	160	450	345
World	23,765	23,895	27,475	27,980	37,635	36,940

* Baltic Republics.

** Based on maximum production estimates. The surplus is the result of mathematical calculation and it is not assumed that it will be reached.

Source: Report of the Preparatory Conference on World Pulp Problems, Canadian Pulp and Paper Association, Montreal, Canada, June 1949.

sion, governs the granting of timber limits, with the result that while all the paper companies have a perpetual supply assured, the lumber companies have not. According to the Commission, only two more medium-sized pulp mills can be supported in Ontario on the basis of present economically accessible areas of timber.

The recommendations of the commission are of interest since they seem to apply with equal force to most of the forestry practices in North America. To reduce waste, the stumps should be cut low, and the size of the tree top left in the woods, should be fixed by regulation. There should be strict control of clearcutting to avoid sunscald and frost pockets, road-building methods in the forests should be improved, and triple stumpage rates provided for timber cut, but left in the forest. Cattle pastures should be in some way regulated, since they destroy humus and thus constitute a great danger to the forest woodlots.

On the question of pulpwood export, this mainly going to the Upped Lake States, the Commission pointed out that local mills have in the past been used as a pawn in the drive for export timber. A clause in most timber leases stating that the companies (especially those in the export market) should practice good forestry, should be more vigorously enforced.

Most of the leases provide further that the pulpwood exported to the United States must under no circumstances be used in the production of newsprint. This, the commission finds to be a useless clause. During the war, overbidding for labor by the export companies had a bad effect on the industry. Rigid control of the export of pulp was recommended.

In October of 1947, the Ontario Government announced that export of pulpwood to firms with no plants in the province would stop in three years, and in the meantime would be curtailed to 50 per cent of the 1942/46 level.[9] Companies with plants were given ten years to readjust their supply problems. The regulation affected spruce, hemlock, birch and all wood cut from private lands.

According to the Royal Commission, spruce in particular had been heavily overcut. Other recommendations of the Commission have not been acted upon, the reason given being that the government has under way a study of the forest reserve, and that this study will not be ready before 1952. In the meantime, the fight between the lumber and paper interests continues. The lumber interests charge that the bigger paper companies have more political influence, and therefore are able to force postponement of the implementation of the recommendations of the Commission.[10]

This conflict between lumber and paper interests seems to be a feature in many parts of the country. However, only in Ontario has it so far exploded into print.

From the point of view of the industry in the Lake States, the supply from Ontario may soon be a thing of the past. Two new 300-ton daily capacity Kraft pulp mills have been added in the Lake Superior region in the postwar years. Both companies, subsidiaries of American concerns, have been granted timber limits in perpetuity.[11] It is unlikely that further pulp mills will be built in Ontario in the near future.

The Royal Commission report from British Columbia,[12] known as the Sloan Report, after the Chief Justice of the Province who headed the Commission, brought in its findings in 1945. British Columbia, especially in the southern part of the province, has forest conditions much like those existing in Washington and Oregon; and for that reason alone, the report is of some interest. It notes that of the total annual depletion of 3,876,421,800 brd. ft., about 82 per cent is due to cut, 7.8 per cent due to fire, and 10.2 per cent due to insects and other causes. The allowable cut is placed at 3,483,000,000 brd. ft. While these overall figures indicate a fairly good situation, the examination of the cut by species shows entirely different results.

Table A tells the story most eloquently. In the case of Douglas fir, most desired by the lumber industry, the supply is limited.

The Commission advocates utilization of waste material and integration of the forest product industries in the province.

In logging, 20 per cent of the total wood volume is left in the forest, depending mostly on the price of lumber. If the price is high enough, more material is brought out. Some of this

TABLE A

Timber Situation in British Columbia

Species	% of Total Coast Cut 1937-1944	% of Each Species to Total Volume of all Species	Supply in Years
Douglas Fir	49.93	24.0	31
Western Hemlock	20.61	29.7	92
Western Red Cedar	19.77	26.2	85
Spruce	4.72	6.4	87
Silver Fir	4.15	11.3	176
White Pine	.76	.4	35
Others	.06	3.0	..

Source: Report of the Commissioner, the Hon. Gordon McG. Sloan, Chief Justice of the British Columbia, relating to The Forest Resources of British Columbia.

TABLE 8

Distribution of World Pulp Consumption and Production

(by regions)

Region	1937 Consumption	1937 Production	1948 Consumption	1948 Production	1955 Requirements	1955 Production
	%	%	%	%	%	%
Europe	42	49	25	29	31	30
Near East	—	—	—	—	—	—
North America	51	46	70	68	63	63
Latin America	1	—	2	1	2	1
Africa	—	—	—	—	—	—
Asia	6	5	2	2	2	2
Oceania	—	—	1	—	1	1
Total	100	100	100	100	100	100

— less than 1%.

Source: Report of the Preparatory Conference on World Pulp Problems. Canadian Pulp and Paper Association, Montreal, Canada, June 1949.

[9] *Op. cit., Paper Trade Journal*, January 29, 1948, p. 7.

[10] *Op. cit., Paper Trade Journal*, Sept. 8, 1949, p. 12.

[11] Annual Reports, Kimberley Clark Corporation, Marathon Corporation.

[12] Sloan, G. McG. Report of the Commissioner, The Forest Resources of British Columbia. Victoria, B. C. King's Printer, 1945.

[13] Reference Tables, Canadian Pulp and Paper Assoc., Montreal, Canada, Nov. 1948.

[14] Dominion Bureau of Statistics. Canada 1949, Official Handbook, p. 127. Ottawa, King's Printer, 1949.

[15] Shallcross, R. E. Some Economic Aspects of the Pulpwood Situation. TAPPI Monograph Series No. 4, Technical Association Pulp and Paper Industry, New York, 1947, p. —.

[16] *Op. cit.*, Guthrie, J. A. p. 41.

TABLE B
Forest Extent

	Square Miles
Forested Areas of Canada *	1,290,960
All of which, save for 123,000 square miles, lies within the provinces.	
Forested Areas Classed as Unproductive	477,850
Small trees in adverse locations not expected to reach merchantable size.	
Productive Forest Areas	813,110
Capable of producing continuous crops of timber.	
Productive Forest Not Presently Accessible	378,110
Accessible Productive Forests	435,000
One half of this area bears trees large enough for use; the remainder is younger growth.	
Privately Owned Forests	100,175
Farm wood lots 34,792	
Others 65,383	
100,175	
Accessible Productive Forests Owned by the Crown	334,825
Cutting Rights Leased by the Crown	169,245
Pulp and paper licenses 127,030	
Saw timber licenses 25,396	
Timber sales 15,123	
Permit berths 1,696	
169,245	
Unoccupied Accessible Productive Forest Owned by the Crown	165,580
(Reserves and parks form part of the Accessible Productive Forests. Restricted cutting is permitted in some of these areas.)	

* Not including Newfoundland.

Source: Dominion Forest Service; CPPA Ref. Tables.

material might be utilized by the pulp mills. However, pulp mills must rely on a fairly uniform supply of pulpwood, and the waste from logging operations may not be sufficiently uniform in quality for that purpose. Of the waste resulting from saw mill operations, which amount to about 30 per cent of the original volume, some hemlock saw mill waste is sold to the paper mills. Further integration appears possible, according to the commission report. As with every other report dealing with the forest resources of North America, this one notes the great waste resulting from small sawmill operations.

The Commission recommended a management licensing system by which an operator may be asked to take over blocks of timberland on which he would be required so to cut the timber that the annual cut equals the annual growth. Large-scale operators would be required to employ professional foresters and small operators to pay for the services of a government forester. Also, increased fire protection rates would be required from the small operators, while large owners would have to provide their own fire protection services and then be exempt from the fee. Many of the recommendations, too detailed to be enumerated here, have in the meantime been incorporated into a new law, under the provisions of which a new pulp mill is now under construction in British Columbia.[17] Exports from Crown lands are restricted in British Columbia and there are now no indications of a change.

For the remaining timber areas of Canada, no such detailed reports are available at the present time.[18]. The Dominion Forest Service indicates that over large areas the annual growth is from 25-40 cu. ft. per acre. This compares favorably with the scientifically managed forests of Sweden where growth averages 28 cu. ft. per acre annually. To replace annual depletion, a growth of only 12 cu. ft. would oe sufficient. But the depletion is concentrated in the accessible areas of the country. Damage due to forest fires, in particular, is concentrated near the population centers, which also are the areas most economically accessible to the timber using industries.

Over the period 1935-1945, pulpwood cut for domestic use constituted 23.2 per cent of the total depletion, and pulpwood for export 5.7 per cent. Of the 23.2 per cent, the major portion eventually filtered into export channels. Over that 10-year period, fire, insects and disease actually accounted for a greater amount of the total depletion than the entire pulpwood cut. Table B showing the total estimated forest extent indicates large productive, but inaccessible areas, which may, however, become accessible in the future.

Nevertheless, it is unlikely that export from these areas will ever reach sizable proportions. Canadian manufacturing facilities have greatly increased in recent years, and the requirements of local mills have similarly grown in consequence.

It has been suggested by American sources[18] that the imports from Canada could be increased by suitable political pressure or economic measures. The past history of the USA and Canada seems to indicate otherwise. Guthrie,[19] in "The Newsprint Paper Industry," mentions several occasions when the USA tried, by retaliatory measures, to force the Canadian Provinces to increase their pulp wood exports. While the provinces prohibited pulpwood exports, the USA increased the levies on Canadian paper imports. These measures were without influence on the Canadian Provincial governments. Eventually, in the Canadian-American reciprocity agreement, newsprint was put on the free list. As a result of the lower costs for labor and raw materials, the U.S. newsprint industry migrated to Canada to a large extent.

Other examples can be cited from more recent times.[18] As a consequence of high prices of newsprint and a war time shortage, the United States government tried, unsuccessfully, to bring action against certain Canadian companies associated with American concerns, under the Anti-Trust laws. Although some of the Canadian companies were wholly-owned subsidiaries of United States firms, the accused companies refused to let the Federal Trade Commission inspect their books. The Canadian Government fully supported that stand. Neither Congressional investigating committees nor threats of reprisal in Congress or in the American press brought about any change, either in the price of newsprint to United States publishers, or in the total volume of newsprint supply available.

TABLE C
Increase in Canadian Paper and Board Production, Selected Years[20]

(1,000's of Tons)

	1939	1947
Mechanical Pulp	2796	4409
Chemical Fiber	1370	2838
Total Paper, incl. Newsprint	3601	5775
Pulp Production by Chief Prod. Provinces:		
Quebec	2119	3752
Ontario	1159	2100
British Columbia	321	593

Source: Canada 1949 Official Handbook of present conditions and recent progress, Edmond Cloutier, King's Printer and Controller of Stationery.

TABLE 9
Canadian Forest Holdings in Accessible Productive Forests

	Square Miles	%
Private Holdings	100,175	23
Crown Holdings:		
leased by Pulp and Paper Mills	127,030	29
leased by others	42,215	10
unoccupied	165,580	38
Accessible productive	435,000	100

One-half of this total area bears trees large enough for use, the other half is young growth.

Source: Dominion Forest Service.

TABLE 10
Canadian Coniferous Stands

(estimated stands of accessible conifers by provinces)

Province	Millions of Cubic Feet
Prince Edward Island	61
Nova Scotia	2,939
New Brunswick	5,450
Quebec	46,755
Ontario	31,784
Manitoba	1,128
Saskatchewan	991
Alberta	7,724
British Columbia	35,880

Source: Dominion Forest Service and Dominion Bureau of Statistics.

TABLE 11
Destination of Canadian Pulp Exports

(in tons)
—1947—

Destination	Sulphite Pulp	Sulphate Pulp
United States	882,501	305,462
British Empire	111,740	9,004
Latin America	12,322	1,384
Europe	10,272	661
Asia	2,033	200

Source: Dominion Bureau of Statistics.

[17] *Fortune Magazine*, Vol. XXXVII, May 1948, p. 187. "Celanese Corporation."

[18] House of Representatives, 80th Congress, 1st Session, Congressional Record, p. 7758; also, H. Res. 58, 80th Congress, Congressional Record, p. 4347.

It is fully in the interests of the Canadian Federal and Provincial governments to control export of pulp and paper closely.

The further the pulpwood is processed, the higher will be the return of U.S. dollars to Canada, the more revenue the Provinces will obtain, and the more people will find employment in the Canadian forest industries. Canadian Unions, company managements and Provincial and Federal governments, having a joint interest and investment in the conservation of raw materials and increased returns from the forest product industries, can resist the pressures that may, from time to time, be exerted from the United States.

From the point of view of the American pulp and paper industry, the outlook for supplies of raw materials for the American mills from Canada is a cloudy one. The Canadian forests are not as vast and the supply not as unlimited as many people in the industry once thought. As a result, the Canadian provincial governments have been increasingly concerned with the need for conserving the forests.

(To be continued in issue of March 2)

SUPPLIERS

The Whiton Machine Co., New London, Conn., manufacturers of Whiton steam turbines, has appointed W. E. Pearson Co., 306 Smith Tower, Seattle, representative for the State of Washington. T. C. Chown, Ltd., 1440 St. Catherine street, West, Montreal, Que., has been named Canadian representative. Both companies are well qualified to act as consultants on steam turbine problems.

Pennsylvania Salt Manufacturing Co. has appointed Hugh C. Land production manager as of February 1.

FUNK TO ADDRESS T.A.P.P.I.

William H. Funk, development engineer of the Lukenweld division of Lukens Steel Co., Coatesville, Pa., will present and illustrate with color slides a paper written by the speaker in collaboration with E. H. Wyche, sales engineer of Lukens, entitled, "Stainless-Clad Steel for Digesters," at the TAPPI Convention in Room B-C at the Hotel Commodore on Tuesday, February 21 at 2:00 P.M. . . . Highlights of the presentation will be an explanation of the benefits users of sulphate and sulphite digesters derive from clean, smooth, corrosion-resistant inner surfaces of stainless-clad steel. The selection and application of the proper types of stainless-clad steels will also be emphasized as a means of reducing maintenance costs and increasing digester life.

DOW ADVANCES GEIB

Fred R. Geib, technical representative in the Midwestern area, of the Dowicide Div. The Dow Chemical Co., has been assigned similar duties on a national basis, W. A. Melching, manager of Dowicide Sales, announced on February 10.

General Electric's Apparatus Depart. has announced that the "More Power To America Special," first train of its kind in industrial history, will be launched on a nationwide tour this spring. Since it is an industrial development enterprise, it will not be open to the general public.

The displays will portray the latest advances in power generation and methods and equipment for the profitable use of electricity throughout all industry. They have been designed especially for those who produce electric power and those who put it to work in industry and the community.

Included in the exhibits will be turbines of all types—steam, gas and mercury; equipment for transmitting and distributing electric power, and motors and controls engineered into combinations that can perform a wide variety of industrial operations.

Other displays will include precise measuring and recording instruments; new developments for community improvement, such as street lighting and sewage treatment equipment, and products which contribute to national security.

Wheeler Roll Co., Kalamazoo, Mich., has named P. E. Dutcher, 73 Randolph street, Springfield 8, Mass., as eastern representative.

Battelle Memorial Institute has appointed Dr. Hamnett P. Munger to coordinate its air-pollution research activities and to act in a liaison capacity between Battelle and industry.

Westinghouse Electric Corp. has announced the appointment of O. O. Rae as manager of the company's Southeastern District. Mr. Rae will succeed Thomas Fuller who is retiring after 44 years with the company.

Eriez Manufacturing Co., Erie, Pa., has promoted R. A. Roosevelt to the position of sales manager. He replaces George R. Wellmon, resigned. In his new position Mr. Roosevelt will direct sales and advertising for the Eriez firm, which manufactures and sells magnetic separation equipment through 30 domestic and 22 foreign sales offices.

Allis-Chalmers Manufacturing Co. has proposed a maximum pension for life of $100, including Social Security benefits, for salaried and hourly employes meeting service and age requirements. Walter Giest, Allis-Chalmers president, said that the pension plans would apply to employes within and without collective bargaining units.

New Sand Processing Plant

CINCINNATI, Ohio—An unusual new industry will be brought to Cincinnati to process various types of sand which will be brought from the Melbourne area of Florida and converted into products for use in printing inks, paper, rubber, paint pigments and other commercial items, according to Frederick A. Hauck, head of the Continental Mineral Processing Corp. The company has acquired a five-acre tract on the Pennsylvania Railroad near the Sharonville Ordnance Depot.

Mr. Hauck is widely known in the mineral field. He has been associated with the Atomic Energy Commission and the Bureau of Mines. He is president of Precious Minerals, Inc., 1st National Bank Bldg., Cincinnati; and vice-president of Rare Minerals Corp. of New York and Nevada.

Industrial Instruments Course

NEW YORK—A new 61-part training course treating the knowledge and use of industrial instruments as a career in itself has been announced by Admiral George S. Bryan, dean of the faculty of International Correspondence Schools. Starting with a basic mathematics review, basic science and electricity, the new course then teaches in detail the instrumentation and instrument-control of industrial processes. Its final 18 parts deal with steam power specialties—combustion, steam generation and condensate.

Technology Course at Lowell Textile

LOWELL, Mass.—The Lowell Textile Institute (Evening Division) is now offering a course on Tuesday evenings from 7:00 P.M. to 9:00 P.M., entitled "Introduction to Paper Technology." The fee is $3.50 per person for the term which will conclude March 7.

Especially designed for the paper salesman, printer and other users of paper, the course is in charge of Dr. Geoffrey Broughton, head of the newly established Paper Engineering Department at the Institute.

REGENSBURGER HEADS LINK-BELT ENG. DPT.

Link-Belt Co. has appointed H. Walter Regensburger chief engineer of its General Engineering Department to succeed Harry L. Strube, who has retired. The department has been transferred from Philadelphia to 301 West Pershing Road, Chicago.

Assisting Mr. Regensburger, will be Charles M. Young, Jr., in the capacity of chief developmental engineer, and Harold F. Watson as chief standards engineer. Both men have been identified with the General Engineering Department since it was first organized in Philadelphia in 1946, and both were previously members of the Philadelphia plant engineering department.

NO OTHER BELT DRIVE HANDLES POWER LIKE

UNI-PULL

For Efficiency, Long Service, Low Maintenance You can't Beat The New Uni-Pull Drive With Water-Proof Leather Belting.

Uni-Pull, the modern, compact, individual drive keeps maximum power flowing steadily from pulley to pulley.

Here are two reasons for this efficient, uniform power flow:

1. UNI-PULL MEANS UNIFORM PULLING POWER ACROSS THE PULLEY FACES—No multiple-belt drive can match the permanently unified pulling power of the modern flat leather belt. *One* belt, *one* pulley grip, *one, even* tension across the pulley face. Result: Longer service life.

2. UNI-PULL MEANS UNIFORM PULLING POWER AROUND THE PULLEY FACES—The tension-control motor base automatically keeps the belt at the proper tension despite changes in load. You get smooth, steady power delivery plus longer bearing life.

No substitute material yet discovered can surpass the all round power-transmitting ability of leather belting. And remember, modern leather belting is available in *water-proof* quality.

Modernize your power transmission with the Uni-Pull drive.

American LEATHER BELTING *Association*

Headquarters for Authentic Power Transmission Data

41 PARK ROW, NEW YORK 7, NEW YORK

AL 40

Patent Abstracts

● ***In addition to abstracts on the technology of pulp, paper and related industries, miscellaneous abstracts which may provide useful information are included.***

United States

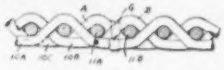
2,495,707 — Preparation of Fibers from Carboxymethylcellulose. John David Reid and George C. Daul, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture. Filed August 9, 1946 — Issued January 31, 1950. (Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757.)

A process of making a fiber comprising extruding a solution in water of a salt of carboxymethylcellulose, the carboxymethylcellulose containing about 0.5 to 1 carboxymethyl group per glucose unit through a filament forming aperture into a precipitating solution containing a salt of polyvalent metal that forms a water-insoluble precipitate with carboxymethylcellulose, thereby forming a filament comprising the corresponding metal compound of carboxymethylcellulose no acid being added to the precipitating solution, whereby the salt of the polyvalent metal reacts directly with the salt of carboxymethylcellulose.

2,495,807 — Double Walled Box or Carton. Kenneth T. Buttery, Kalamazoo, Mich., assignor to Sutherland Paper Company, Kalamazoo, Mich. Filed September 9, 1946—Issued January 31, 1950.

A collapsible double walled box or carton formed of an integral blank cut and scored to provide an inner bottom panel and inner side and end walls hingedly connected to the inner bottom panel, and diagonally foldable corner members hingedly connected to the adjacent ends of the inner side and end walls and foldable on the outer sides of the inner end walls, outer side walls hingedly connected to the upper edges of the inner side walls hand having corner flaps at their ends foldable upon the folded corner members, an outer bottom panel hingedly connected at one side edge to the bottom edge of one of said outer side walls and having a sealing flap hingedly connected to its other side edge and lapped upon and adhesively secured to the inner side of the other outer side wall, and outer end walls hingedly connected to the upper edges of the inner end walls and foldable downwardly on the outer sides thereof over the said corner members and corner flaps when they are in erected position against the outer sides of the inner end walls, said outer end walls having tucking flaps hingedly connected to their bottom edges disposed under the folded corner members and flaps and between said outer and inner bottom panels and having slits at the ends of the hinges thereof having interlocking engagement with the bottom edges of said corner flaps, said outer end walls and inner end walls constituting means for housing and retaining said foldable corner members in a collapsed folded position therebetween when the tucking flaps of the outer end walls are disposed between said outer and inner bottom panels.

2,496,052 — Seam for Woven Wire Fabric. Alfred G. Hose, Lakewood, and Donald C. Dilley, Shaker Heights, Ohio, assignors to The Lindsay Wire Weaving Company, Cleveland, Ohio. Filed March 11, 1948—Issued January 31, 1950.



A woven wire belt for a Fourdrinier machine having warp wires of bronze connected at their adjacent ends by an alloy of gold.

2,496,336 — Carton and Method of Sealing the Flaps Thereof. William J. Cupo, Jersey City, N. J., assignor to Waldorf Paper Products Co., St. Paul, Minn. Filed September 1, 1944—Issued February 7, 1950.

The method of sealing open ends of cartons having side and front and back wall end flaps adapted to be folded together to form a closure, comprising providing the two opposed side wall end flaps each with at least one aperture and the end flap of the two opposed back and front walls which is to be folded into engagement with the side wall flaps with apertures adapted to communicate with the first-mentioned apertures when those flaps are folded into overlapping relation, retaining the imperforate condition of the remaining end flap, applying adhesive material to inner flap surfaces so as to provide adhesive interposed between adjacent surfaces of all of the flaps when folded in overlapping relation, folding the apertured side wall flaps inwardly to extend in opposed relation substantially in the plane of the open end of the carton, folding the other apertured flap in overlapping relation against the side wall flaps with the apertures in registry, folding the imperforate flap in overlapping relation against the apertured overlapping flaps, biasing the opposed side wall flaps to their folded positions, withdrawing air through passageways formed by the apertures in registry from exteriorly of the carton toward the interior thereof to create a differential in pressure on opposite sides of the stack of overlapped flaps, and maintaining such pressure differential until said flaps are anchored together to seal the carton end.

Canadian

462,587 — Beating Apparatus. Erik Stephansen, Bestun, near Oslo, Norway, assignor to Papirindustriens Forskningsinstitutt, Skoyen, near Oslo, Norway, assignor to Otto Imset, Bestun, Oslo, Norway. Filed December 1, 1947—Issued January 17, 1950.

Apparatus of the kind described comprising a roller provided with grinding elements on its surface, means for supporting the roller rotatably round its axis, a casing enclosing the roller, means for supporting the casing for rotation about an axis parallel to the axis of the roller, means for adjusting the distance between the rotation axes of the roller and the casing, and driving means by which the rotation speed of the roller and the casing can be adjusted independently of each other.

462,588 — Coating Composition Having Fireproof Properties. Maurice Jacobs, Ridgefield, New Jersey, U.S.A., assignor to Proofene Manufacturing Company, Inc., New York, New York, U.S.A., assignor to Albert W. Churman, Trustee, New York, New York, U.S.A. Filed February 9, 1943—Issued January 17, 1950.

The process of making a substantially fireproof building element which comprises thoroughly mixing a loose fibrous material with a composition comprising an emulsion of a solution of a sodium scilicate of 40° to 47° Be., a high boiling mineral oil, a tung oil and a mica filler, with the addition of titanium dioxide, thereby thoroughly coating said fibrous material with said composition, and formed into the form of a building element in the proportions of sodium silicate 44 gallons, mineral oil 1⅛ gallons, and drying oil 2¼ gallons.

462,664 — Method of Impregnating Fibrous Articles. Rudolph H. Von Liedtke, Chicago, Illinois, U.S.A., assignor to Canadian Line Materials, Limited, Scarboro Junction, Ontario, Canada. Filed February 7, 1946 — Issued January 24, 1950.

The process of impregnating an article formed of compacted fibrous material, said process comprising forming a temporary impervious coating adjacent one surface of the article, said coating being characterized by the fact that at a predetermined temperature it is destroyed, subjecting the article to a non-absorbent, waterproof, binding material, reducing the pressure while the article is subjected to the binding material and maintaining the temperature of the binding material below that at which such coating is destroyed, thereafter raising the pressure while the article is still subjected to the action of the binding material and raising the temperature of the binding material to a point where it will destroy said coating.

462,771 — Sealing of Paper Container. Arthur G. Hartman, Toledo, Ohio, U.S.A. Filed June 8, 1945—Issued January 31, 1950.

A paper shipping container having at seams thereof a non-tacky but flexible and non-brittle sealing coating, comprising one part of a hydrogenated castor oil and from two to ten parts of solid wax.

462,797 — Filter. Arthur Wright, Upper Montclair, New Jersey, U.S.A. Filed December 14, 1942—Issued January 31, 1950.

In a continuous rotary drum filter, a belt for compressing the cake formed on the drum of said filter, comprising, a plurality of parallel cords disposed peripherally over only the cake washing and drying zone of said drum for movement therewith, and means for maintaining said cords under tension and in contact with said drum.

How Valuable Are Patent Abstracts

The *P.T.J.* would like your opinion on the value to you of its patents section. Will you tell us:

1. No value, should be dropped.
2. Listing of number, title, inventor and ownership is sufficient.
3. Non-technical abstracts of only most important patents would be better than present system, 5 to 10 per week.

Please let us know how you feel. *You are the boss.*

THE EDITOR

FINANCIAL RECORD

PREFERRED STOCKS	Per Share Earnings: Calendar Year 1948	Per Share Earnings: 12 Mo. to Approx. 9/30/49	Indic. Annual Divid. Rate	Feb. 7 Approx. Market Price
Armstrong Cork Co. $3.75 Cum.	$46.33*	$38.47*a	$3.75	$101⅝
Armstrong Corp Co. $4.00 Cum. Conv.	46.33*	38.47*a	4.00	111¾
Celotex Corp. 5% Cum.	26.42c	7.59e	1.00	17⅛
Champion Paper & Fibre $4.50 Cum.	99.97f	37.50j	4.50	100½
Container Corp. of Amer. 4% Cum.	105.41	90.43	4.00	103½
Crown Zellerbach $4.20 Cum.	63.92i	57.02e	4.20	104¼
Dixie Cup Co. $2.50 Cum. Conv. Cl. A	10.10	10.44	2.50	53½
Flintkote Co. $4 Cum.	83.25	61.44	4.00	104½
Robert Gair Co., Inc. 6% Cum.	17.08	12.88	1.20	18½
International Paper Co. $4 Cum.	263.00	245.41	4.00	105
Johns-Manville $3.50 Cum.	209.89	204.89	3.50	121⅞
Kimberly Clark Corp. 4¼% Cum.	80.74	70.92	4.50	104⅜
Kimberly Clark Corp. 4% Cum. Conv. 2nd	41.59*	42.20*	4.00	111¼
MacAndrews & Forbes 6% Cum.	62.23	64.10	6.00	136¼
Mead Corp. 4¼% Cum.	73.46	49.00k	4.25	90
Mead Corp. 4% Cum. Conv. 2nd	29.91*	19.93k*	2.00	34½
Paraffine Cos. Inc. 4% Cum. Conv.	156.11	56.46m	4.00	103½
Rayonier Inc. $2 Cum.	16.43	10.76	2.00	31¾
St. Regis Paper Co. 4.40% 1st A	79.90	29.04m	4.40	91
Scott Paper Co. $3.40 Cum.	59.06	52.36	3.40	95¾
U. S. Gypsum Co. 7% Cum.	314.45	281.64	7.00	188
United Wallpaper Inc. 4% Cum. Conv.	(d)0.79	(d)2.97m	2.00	25½
West Virginia Pulp & Paper 4½% Cum.	79.45c	66.06e	4.50	110⅛

COMMON STOCKS				
APW Products Co.	$0.73	(d)$1.01	—	3¾
American Writing Paper Corp.	(d)0.15	0.05	—	6½
Armstrong Cork Co.	7.54	6.13a	$3.00	49¾
Celotex Corp.	7.21c	1.87e	1.00	19⅜
Certain-Teed Prods. Corp.	4.02	3.09	1.00	17⅛
Champion Paper & Fibre	8.70f	3.20j	2.00	33⅜
Congoleum Nairn Co.	5.78	4.92a	2.00	28¾
Container Corp. of America	10.12	8.50	4.00	40¾
Crown Zellerbach	7.16i	6.33e	2.00	32⅛
Dixie Cup Co.	6.70	7.00	1.50	37⅜
Eastern Corp.	4.76	(d)0.07	—	14½
Flintkote Co.	5.86	4.14	2.50	31⅛
Robert Gair Co., Inc.	2.67	1.96	0.70	7⅞
Great Northern Paper Co.	4.63	5.21	2.80	44
International Paper Co.	8.36	7.80	2.50	36¼
Johns-Manville Corp.	5.22	5.07	2.50	45⅞
Kimberly Clark Corp.	5.02	4.32	1.65	27½
MacAndrews & Forbes t.o.	3.68	3.79	2.50	39½
Marathon Corp.	4.11e	3.29e	1.40	27½
Mead Corp.	6.36	3.98k	1.60	16¾
National Container Corp.	2.28	1.04	0.40	7⅜
Paraffine Cos. Inc.	2.45	0.85m	1.20	16⅜
Rayonier, Inc.	9.09	5.52	2.00	27⅞
Ruberoid Co.	10.72	8.52	3.25	55¼
St. Regis Paper Co.	2.71	0.89m	0.60	7⅜
Scott Paper Co.	4.15	5.38	3.00	67⅜
Sutherland Paper Co.	6.02	4.62m	2.50	39
Union Bag & Paper Corp.	9.17	5.01m	2.25	27⅜
United Board & Carton	2.04b	(d)1.61g	—	8½
U. S. Gypsum Co.	15.04	13.43	9.00	115¼
United Wallpaper	(d)0.10	(d)0.01m	—	3⅜
West Virginia Pulp & Paper	11.33c	9.31e	3.00	48¾

(a) 12 months to approximately 6/30/49
(b) Year ended 11/23/48
(c) Year ended 10/31/48
(d) Deficit
(e) 12 months to approximately 10/31/49
(f) 11 months to 3/31/49
(g) 12 months to approximately 11/13/49
(h) 12 months to approxmately 7/31/49
(i) 12 months to approximately 1/30/49
(j) 6 months to 9/30/49
(k) 12 months to approximately 10/2/49
(m) 12 months to 12/31/49.
(*) Earnings per combined preferred shares.

Dividends Declared

Rolland Paper Co., Ltd., has declared a dividend of $1.06¼ per share on preferred stock, payable March 15 to stockholders of record March 1.

Armstrong Cork Co. has declared a regular dividend of 50 cents a share on its common stock, payable March 1 to stockholders of record February 10; also a dividend of 93¾ cents a share on its $3.75 cumulative preferred and $1 a share on its $4 cumulative preferred, both payable March 15 to stockholders of record March 1.

Millers Falls Paper Co. has voted two quarterly dividends on the common of 50 cents payable February 10 and May 10. These will be the first payments on the common since 25 cents was paid in 1948.

MacLaren Power & Paper Co. has declared a dividend of 50 cents per share, payable February 28 to stockholders of record February 4.

Gaylord Container Corp. has declared a dividend of 37½c a share on its Common Stock payable March 10, to shareholders of record February 28.

Rayonier Inc. has declared a regular quarterly dividend of 50 cents per share on the $2 Cumulative Preferred Stock, payable April 1, to stockholders of record March 10.

Donohue Bros. Ltd. has declared a dividend of 25c on common stock, payable March 1 to stockholders of record February 15.

Eddy Paper Co., Ltd., has declared a quarterly dividend of 25c per share on the outstanding Class "A" stock, payable March 15 to stockholders of record February 18.

Powell River Co., Ltd., has declared a dividend of 50 cents per share, coupon No. 19, payable March 15.

Northern Paper Mills has declared a dividend of 50 cents per share on common stock. Payable on March 10 to stockholders of record on February 24.

Van Reekum Affiliate Expands

NEW YORK—Van Reekum Paper Inc. announces that its Amsterdam affiliate has extended its operations through a merger with N. V. Gepacy, a local paper importing and exporting enterprise active in the Netherlands, with branches in the Near and Far East.

Building

- **FOR THE PAPER INDUSTRY**
- We design, build, and equip paper and pulp mills ... steam generating plants ... and facilities for eliminating stream pollution.
- Under one contract and one responsibility, we deliver jobs complete, ready for operation.
- We also furnish engineering reports and surveys. Current cost data available at all offices.

The H.K. Ferguson Co.
INDUSTRIAL ENGINEERS AND BUILDERS

THE FERGUSON BUILDING • CLEVELAND, OHIO
OFFICES IN NEW YORK, HOUSTON, CHICAGO, CINCINNATI AND LOS ANGELES

PRICES

The prices below reflect general market quotations at the mill level on the standard grades in which the normal volume of business is being done. Does not include occasional spot offerings.

NEW YORK

Delivered Ports

Standard News, per ton—

Rolls, contract	$100.00/ —
Sheets	115.00/ —

F.o.b. Mills, Carload freight allowed, dock N. Y.

Kraft— per cwt., 40# base wgt.

Standard Wrapping Rolls	$6.50/ —
No. 1 Wrapping Rolls	7.25/ —
Standard Bag	6.25/ —

Tissues—per ream 25x36 (480) 10 lbs. 2500 lbs. or more

Wh. No. 1 Frd...‡	$1.40 / 1.55
Wh. No. 1 M. G...‡	1.40 /
Wh. No. 1½...‡	1.30 / 1.35
Wh. No. 2...‡	1.10 / 1.15
Kraft Non-Tar...‡	1.25 /
White Non-Tar...‡	1.52½/

Toilet—per case of 100 rolls—1 M sheets.

Unbleached 4½x4½	$5.75/ —
Bleached 4½x4½	6.95/ —
Bleached 4½x5	8.80/ —
Per Case of 50 rolls—2000 sheets	
Unbleached 4½x4½	$5.75/ —
Bleached 4½x4½	6.80/ —
Per Case of 100 rolls—1000 sheets	
Facial, 4½ x 5, 2 ply	$8.95/$9.45

Paper Towels—per case of 3750.

Wh. Jr. M'tif'd 9¼x9¼	$5.25
Br. Sr. M'tif'l 10x12	3.60
Dr. Jr. M'tif'd 9¼x9¼	3.10
Br. Jr. Sgl. fold 10x10¾	3.15
Blchd. 7½ x 11, 24/25 rolls	$3.95/$6.25

Manila, per cwt.

No. 1 Jute Tag 40 lb., sheets*	$15.05/$17.50
Reg. Jute M.F. Manila, sheets*	13.50/ 15.50
Wrapping Manila	8.75/ 10.50
Printing Manila	10.00/ 11.00

* Less usual allowance for rolls.

Boards, per ton—

Filled News	$72.50/$75.00
Plain Chip	70.00/ —
Blchd. Mla. L-d. Chip*	97.50/ —
White Pat. coated*	115.00/ —
Kraft Liners 42 lb.	100.00/
Kraft Corr. .009	105.00/
Binders Boards	110.00/116.00

* Base Prices per 10 tons. Less than 10 ton but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101.120, add $5.

WORLD WOOD PULP MARKETS

First Quarter Contract Prices, Per Short Air-Dry Ton

	Delivered, with varying freight allowance		Full freight allowance* On dock Atlantic Ports		
	U. S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$65.00/ —	$65.00/$67.50			
Siderurus Pulping News	65.00/ —	65.00/ 67.50			
Soda, Bleached	113.00/ —	113.00/ —		Competitive	
Sulphate, Bleached	118.00/126.00	126.00/ —	125.00/128.00		Competitive
Sulphate, Unbl'd North'n		82.50/105.00	82.50/ 85.00	with	
Sulphate, Unbl'd South'n	80.00/ 82.50				
Sulphite Blchd. (S'ftw'd)	118.00/ —	118.00/ —	118.00/ —	Domestic	Competitive
Sulphite, Blchd. (H'dw'd)	113.00/ —				
Sulphite, Unbleached	100.00/ —	100.00/ —	100.00/ —	Grades	
Sulphite, Unbl'd (Glassine)	105.00/ —	105.00/ —	104.00/105.00		

* Ex dock quotations average $5.00 lower.

WASTE PAPER MARKET

Prices to Mills*, (Per Ton) F.o.b. Cars Shipping Point

	New York	Philadelphia	Boston	Chicago
	Feb. 10	Feb. 8	Feb. 4	Feb. 6
No. 1 Mixed Paper	$7.00/ 8.00	$7.00/ 9.00	$9.00/ —	$10.00/ —
Boxboard Cuts	7.00/ 8.00	6.00/ 8.00	/ 8.00	13.00/ —
Mill Wrappers	10.00/ 11.00	10.00/ —	11.00/ 11.50	12.00/ —
No. 1 News	12.00/ 13.00	10.00/ 12.00	11.00/ 12.50	18.00/ —
Over-issue News	15.00/ 16.00	12.00/ 14.00	12.00/ 14.00	21.00/ —
Corrugated Containers	14.00/ 15.00	16.00/ 18.00	17.50/ —	22.00/ —
New Corrugated Cuts	20.00/ 21.00	20.00/ —	19.00/ 21.00	25.00/ —
Double Kraft Ld. Corr. Cuts	35.00/ 36.00	30.00/ —	25.00/ —	45.00/ —
Used Kraft Bags	30.00/ 35.00	25.00/ —	25.00/ 30.00	25.00/ —
No. 1 Brown Kraft Paper	35.00/ 37.50	25.00/ 30.00	25.00/ 30.00	30.00/ —
Super Resorted Br. Kraft	37.50/ 40.00	30.00/ 35.00	35.00/ 40.00	40.00/ —
New Br. Kraft Env. Cuts	65.00/ 70.00	60.00/ 65.00	60.00/ 65.00	55.00/ —
New Br. Kraft Cuts	42.00/ 45.00	45.00/ —	45.00/ —	50.00/ —
No. 1 Gdwd. Shvs.	28.00/ 30.00	20.00/ 25.00	25.00/ —	23.00/ —
White Newsblanks	57.00/ 60.00	55.00/ —	55.00/ 60.00	45.00/ —
No. 1 Flyleaf Shvs.	35.00/ 37.50	25.00/ 30.00	35.00/ 45.00	40.00/ —
No. 1 Soft Wht. Shvs.	85.00/ 90.00	65.00/ 70.00	65.00/ 70.00	60.00/ —
Super Soft Wht. Shvs.	90.00/ 95.00	70.00/ 75.00	85.00/ 95.00	70.00/ —
Hd. Wht. Shvs.	90.00/ 95.00	80.00/ 85.00	90.00/100.00	80.00/ —
Hd. Wht. Env. Cuts	110.00/115.00	90.00/ 95.00	105.00/ —	90.00/ —
New Manila Env. Cuts	65.00/ 70.00	60.00/ 65.00	60.00/ 70.00	55.00/ —
Col. Tab Cards	35.00/ 40.00	30.00/ 35.00	35.00/ —	40.00/ —
Manila Tab Cards	65.00/ 70.00	65.00/ 70.00	75.00/ 80.00	65.00/ —
No. 1 Mixed Ledger	35.00/ 37.50	30.00/ 32.50	34.00/ 37.50	40.00/ —
White Ledger	45.00/ 50.00	45.00/ 50.00	40.00/ 50.00	45.00/ —
Mixed Books & Mags.	13.00/ 15.00	10.00/ 12.00	12.00/ —	15.00/ —
No. 1 Rep'd Hvy. Books & Mags.	25.00/ 30.00	22.00/ —	23.00/ 25.00	25.00/ —

* Includes brokers' fee.

The following prices are representative distributors' resale prices:

Rag Content Bonds and Ledgers—

White, 20 lb.

Bonds

	4 Ctns. per cwt.
100% Rag. Ex. No. 1	‡ $
100% Rag	‡
75% Rag	‡
50% Rag	‡
25% Rag	‡

Ledgers

	4 Ctns. per cwt.
100% Rag. Ex. No. 1	‡
100% Rag	‡
75% Rag	‡
50% Rag	‡
25% Rag	‡

Sulphite Bonds and Ledgers

White, 20 lb.

Bonds

	4 Ctns. per cwt.
Watermarked	$16.75/$17.70
Plain	15.60/ 16.10

Ledgers

	4 Ctns. per cwt.
Watermarked	$18.20/ 19.00

White Book

Conversion Coated	Case per cwt.
No. 1	$19.75/$21.15
No. 2	19.25/ 19.90
No. 3	17.75/ 19.15
Machine Coated	
No. 1	16.40/ 16.65
No. 2	14.40/ 15.15
Uncoated	
No. 1 Antique (Watermarked)	16.40/ 17.90
Offset	15.15/ 16.65
A Grade E. F.	15.65/ —
A Grade S. C.	15.90/ 16.15
B Grade E. F.	14.90/ 15.15
B Grade S. C.	15.40/ 15.65

‡ Indicates a price change. Details reported in *Trends*.

Rag Market

New Domestic Cotton Cuttings

(Prices to Dealers, F.o.b. Ship. Pt.)

	Per 100 lbs.
White Shirt	$10.50/ $11.25
Unbleached Muslin	10.25/ 11.00
Light Silesias	6.75/ 7.75
White Black Blue Overalls	5.75/ 6.50
Blue Overalls	4.50/ 5.00
Fancy Shirt	4.50/ 5.00
Percales	5.50/ 6.00
Light Prints	5.50/ 6.00
No. 1 Washables	2.75/ 3.00
Bleachable Khaki	4.50/ 5.00
Unbleachable Khaki	3.75/ 4.50
Cottonades	4.00/ 4.75
Lt. Flannelettes	6.50/ 7.50
Men's Corduroy	3.50/ 4.25
Women's Corduroy	3.00/ 3.75
Canton Flannels, Blchd.	8.75/ 9.25
Underwear Cutters, Blchd.	11.00/ 11.50
Underwear Cutters, Unblchd.	10.75/ 11.75

Old Domestic Cotton Rags

(Prices to Dealers, F.o.b. Ship. Pt.)

	Per 100 lbs.
No. 1 Whites, Repacked	$4.25/ $4.75
No. 1 Whites, Miscllaneous	3.00/ 3.50
No. 2 Whites, Repacked	3.00/ 3.25
No. 2 Whites, Miscellaneous	2.75/ 3.00
Cotton Pants & Overalls	2.50/ 2.75
Thirds and Blues, Repacked	2.50/ 2.75
No. 1 Roofing Rags	1.40/ 1.50
No. 2 Roofing Rags	1.25/ 1.35
No. 3 Roofing Rags	1.20/ 1.35
No. 4 Brussels & hrd. Bck'd crpts.	1.15/ 1.20
Roofing Bagging	1.00/ 1.10

New Foreign Cotton Cuttings

(Prices to Mills, F.o.b. Dock, N. Y.)

	Per 100 lbs.
New Dark Cuttings	$2.75/ $3.00
New Mixed Cuttings	2.75/ 3.00
Light Silesias	6.50/ 7.00
Light Flannelettes	5.50/ 6.00
New White Cuttings	10.00/ 10.50
New Unbleached Cuttings	10.00/ 10.50

Fancy Shirt Cuttings	4.50/	4.75
Light Prints	4.25/	4.50
Bleachable Khaki, No. 1	4.25/	4.50
Unbl. Khaki, No. 1	4.00/	4.25

Old Foreign Rags

(Prices to Mills, f.o.b. Dock, N. Y.)

	Per 100 lbs.	
No. 1 White Cottons	$6.50/	$7.00
No. 2 White Cottons	5.50/	6.00
No. 3 White Cottons	4.00/	4.50
No. 4 White Cottons	3.00/	3.50
Extra Light Prints	4.50/	5.00
Old Light Prints	4.00/	4.25
Med. Light Prints	2.50/	2.75
Dutch Blue Cottons	3.25/	3.50
Checks and Blues	2.75/	3.00
Linsey Garments	2.10/	2.40
Dark Cottons, European	2.00/	2.10
Dark Cottons, Egyptian	1.85/	2.00
Old Shopperies	1.75/	1.85
New Shopperies	2.00/	2.25

Bagging

(Prices to Dealers, f.o.b. N. Y.)

	Per 100 lbs.	
Foreign Gunny	$6.00/	6.50
Domestic Gunny, No. 1	6.00/	6.50
Heavy Wool Tares	6.00/	6.25
Foreign Manila Rope	4.50/	4.75
Domestic Manila Rope	5.00/	5.25
Jute Strings	5.50/	6.00
No. 1 Sisal Strings	3.00/	4.50
Mixed Strings	1.15½	1.30
Paper Mill Bagging	3.50/	4.00
No. 1 Scrap Burlap		
Foreign	5.50/	6.00
Domestic	5.75/	6.25
Austr. Wool Pouches	—/	6.00
New Burlap Cuttings	6.50/	7.00

MATERIALS

Aluminum, sulfate:
- coml. bags, wks. cwt. 1.50
- iron-free 2.75

Alcohol, ethyl:
- tax free, dms. c.l. gal. .39
- dcld. East Miss.

Casein, acid-prec.:
- dom. sh. pt. c.l. lb. .24 / .25
- imp. ex-dock lb. .20½/ .21

Caustic soda:
- c.l. wks. solid, 76%, cwt. 3.05
- flak. & grd. 400-lb. drums 3.45
- 100-lb. drums 3.95
- liquid 50% tanks 2.40
- liquid 73% tanks 2.50

China clay:
- dom. air-float. filler, c.l. wks. ton 10.00
- water-washed 11.00
- coating 16.30 /30.00
- imported, ex whse., short ton 15.20 /28.35

Chlorine:
- single-unit tanks, works cwt. 2.40
- multi-unit cwt. 2.70 / 3.90

Formaldehyde:
- USP, ish. dms. c.l. wks. lb. .0570
- l.c.l. E. wks .0620

Fuel oil:
- Bunker C, No. 6 Cal. hvy tanks, refinery bbl. 1.25 / 1.55
- light bbl. 1.65 / 2.10

Hydrogen peroxide:
- USP, 35% clys. E of Miss. lb. .23½

Lime:
- hydrated, bags, wks. Buffalo ton 13.50

Rosin:
- B gum, drms, c.l. Savan. cwt. 5.75
- GHIK gum, do. cwt. 6.11
- B wood, do. cwt. 4.25
- FF wood, do. cwt. 5.50

Rosin size:
- 70%, gum & pale grds, tank cars, south. sh. pt. cwt. 5.10 / 5.45

Salt cake:
- dom. bulk, c.l. wks. ton 22.00

Soda ash:
- light, 58%, bags, wks. cwt. 1.25
- bulk cwt. 1.00

Sodium silicate 40°:
- turbid, c.l. wks. cwt. 1.00
- l.c.l. wks. 1.25 / 1.35

Sodium peroxide:
- dms. c.l. E. of Miss. lb. .18
- l.c.l. do lb. .18½/ .19

Soybean, protein:
- chem. isol, wks. c.l. lb. .19½/ .20
- Cinn. and Chic.

Sulfuric acid:
- 60° Be. clys. c.l. cwt. 1.40
- E. wks.
- l.c.l. cwt. 1.80 / 2.50

Sulfur:
- crude c.l mines, contract, long ton 18.00
- f.o.b. vessels Gulf 19.50
- Export, f.o.b. Gulf 22.00

Sulfur dioxide:
- liquid, coml. cyl. wks. lb. .09
- multi-unit cars lb. .0535

Starches:
- pearl corn, bags, c.l. Chic. cwt. 4.87
- white dextrines, c.l. Chic. cwt. 6.14
- potato, Idaho, c.l. wks. cwt 5.00 / —
- potato, Maine, c.l. wks. cwt. 4.75 / —
- tapioca, conv. dextrines cwt. 8.75 / 9.00
- medium grds, Gulf ports 6.50
- low, Siam, on dock NY 4.50 / 5.50

Talc:
- domestic, 50-lb. sacks, c.l. wks. ton 23.00 /28.00

Titanium dioxide:
- anastase, c.l. dcld., bags lb. .19½
- l.c.l. dcld. lb. .20
- rutile, c.l. dcld. lb. .21½
- l.c.l. dcld. lb. .22½

NOTE: For special market conditions, see *Trends*.

IMPORTS

IMPORTS AT NEW YORK

Week Ending February 11

Newsprint

Gilman Paper Co., Fort Avalon, Cornerbrook, 45 rolls.

Wall St. Journal, Fort Avalon, Cornerbrook, 153 rolls.

Hearst Enterprises, Inc., Fort Avalon, Cornerbrook, 277 rolls.

N. Y. Herald Tribune, Fort Avalon, Cornerbrook, 815 rolls.

N. Y. Times Co., Fort Avalon, Cornerbrook, 449 rolls.

N. Y. World Telegram, Fort Avalon, Cornerbrook, 1638 rolls.

National Herald, Fort Avalon, Cornerbrook, 41 rolls.

Bato Co. Inc., Fort Avalon, Cornerbrook, 38 rolls.

Bulkley Dunton Pulp Co. Inc., Fort Avalon, Cornerbrook, 81 rolls.

Montmorency Paper Co. Inc., Pankakoski, St. Johns, 2586 rolls.

Reeve Angel & Co., Mormacstar, Helsingfors, 179 rolls.

Madden Reeve Angel & Co. Inc., Mormacstar, Helsingfors, 48 rolls.

Printing Paper

Olympic Shipping Co., Robert Maersk, Rouen, 41 cs.

Drawing Paper

H. Reeve Angel & Co. Inc., American Importer, London, 3 cs.

Halperin Shipping Co., American Importer, London, 2 cs.

Filter Paper

H. Reeve Angel & Co. Inc., American Importer, London, 20 cs.

Gummed Paper

B. F. Drakenfeld & Co. Inc., Parthia, Liverpool, 37 cs.

Serviettes

(———), Parthia, Liverpool, 6 cs.

Packing Paper

J. P. Heffernan Paper Co., Pres. Monroe, Genoa, 40 bls.

Parchment Paper

A. H. Otto, Hermund, Antwerp, 1 cs.

G. C. Lippelgoes, Hermund, Antwerp, 2 cs.

Surface Coated Paper

Gevaert Co. of America, Hermund, Antwerp, 18 cs.

Bristol Boards

Great Lakes Paper Co., Veerdam, Rotterdam, 16 rolls, 9 cs.

Miscellaneous Paper

Pitt & Scott, American Importer, London, 4 cs.

Rags, Baggings, etc.

Midwest Waste Materials Co., Robert Maersk, Antwerp, 210 bls. scrap bagging.

Darmstadt Scott & Courtney, Robert Maersk, Rotterdam, 76 bls. old bagging.

1st National Bank of Boston, Paraguay, Copenhagen, 173 bls. old bagging.

Darmstadt Scott & Courtney, Paraguay, Copenhagen, 115 bls. rags.

(———), American Importer, London, 61 bls. rags, 161 bls. old jute rags.

A. Siegle Corp., Parthia, Liverpool, 63 bls. jute waste.

E. J. Lang, Marengo, Hull, 169 bls. jute bagging.

Bank of The Manhattan Co., Leerdam, Antwerp, 138 bls. cotton rags.

Green Textile Associates, Scania, Santos, 246 bls. rayon waste.

Chase National Bank, Pres. Monroe, Cochin, 100 bls. old jute bagging.

Bank of The Manhattan Co., Exceller, Trieste, 134 bls. jute rags.

National City Bank, Maria Co., Genoa, 133 bls. old waste bagging.

W. J. Green Co., Maria, Genoa, 227 bls. hemp rags.

New England Waste Co., Exchequer, Tuticorin, 300 bls. cotton waste.

Royal Manufacturing Co., Exchequer, Bombay, 200 bls. cotton waste.

Bramlwein Mazur Co., Exchequer, Bombay, 500 bls. cotton waste.

Lush Cotton Products Co., Exchequer, Bombay, 200 bls. cotton waste.

Green Textile Associates, Exchequer, Bombay, 100 bls. cotton waste.

Padawer Waste & Fiber Co., Exchequer, Bombay, 100 bls. cotton waste.

Volkart Bros., Exchequer, Bombay, 150 bls. cotton waste.

Miller Waste Co., Exchequer, Bombay, 100 bls. cotton waste.

Atlas Fibres Co., Exchequer, Bombay, 200 bls. cotton waste.

(———), Martin Carl, Pt au Prince, 96 rolls cotton yarn waste.

Midwest Waste Materials Co., Aalsdyk, Rotterdam, 93 bls. rags.

E. J. Keller Co. Inc., Aalsdyk, Antwerp, 47 bls. old bagging.

Southern Waste Co., Livarden, Buenos Aires, 311 bls. cotton waste.

IMPORTS AT BOSTON

Week Ending February 11

Stone & Downer, Parthia, Liverpool, 10 cs. gummed paper.

Eiof Hansson, Inc., Exceller, Trieste, 1094 bls. woodpulp.

China American Pulp & Paper Co., Exceller, Trieste, 2760 bls. woodpulp.

Castle & Overton, Inc., Samuel Bakke, Genoa, 219 bls. dark cotton rags.

E. J. Keller Co. Inc., Samuel Bakke, Naples, 737 bls. dark cotton rags.

IMPORTS AT PHILADELPHIA

Week Ending February 11

Montmorency Paper Co., Inc., Pankakoski, St. Johns, 1626 rolls newsprint.

E. J. Keller Co. Inc., Robert Maersk, Antwerp, 70 bls. old bagging.

Castle & Overton, Inc., American Importer, London, 19 bls. new cotton rags.

(———), American Importer, Hamburg, 73 bls. jute threads.

China American Paper & Pulp Co., Exceller, Trieste, 1056 bls. woodpulp.

F. Whitaker, Exchequer, Alexandria, 43 bls. bagging.

IMPORTS AT SAVANNAH

Week Ending February 11

New England Waste Co., Steel Recorder, Columbo, 250 bls. hessian rags.

IMPORTS AT CHARLESTON

Week Ending February 11

New England Waste Co., Steel Artisan, Bombay, 250 bls. hessian rags.

IMPORTS AT BALTIMORE

Week Ending February 11

S. Shapiro & Son, American Importer, London, 41 bls. cotton rags.

Chemical Bank Trust Co., Exceller, Bari, 162 bls. cotton rags.

National City Bank, Samuel Bakke, Genoa, 50 bls. cotton rags.

E. J. Keller Co. Inc., Samuel Bakke, Naples, 84 bls. dark cotton rags.

Brindwetu Mazur Co., Exchequer, Bombay, 100 bls. cotton waste.

IMPORTS AT NORFOLK

Week Ending February 11

Darmstadt Scott & Courtney, Robert Maersk, Rotterdam, 96 bls. old bagging.

Darmstadt Scott & Courtney, Paraguay, Copenhagen, 115 bls. rags.

A. de Vries Trading Corp., Hermund, Antwerp, 17 bls. paperstock, 130 bls. scrap bagging.

Lonwar Textile By Products, Hermund, Antwerp, 370 bls. jute waste.

National City Bank, Hermund, Antwerp, 119 bls. jute waste.

(———), Exceller, Trieste, 305 bls. jute rags.

J. J. Rozendaal, Aalsdyk, Rotterdam, 84 bls. old bagging.

Schwabach & Co., Exchequer, Alexandria, 100 bls. cotton waste.

E. J. Keller Co. Inc., Exchequer, Alexandria, 136 bls. old jute rags.

Green Textile Associates, Exchequer, Alexandria, 50 bls. cotton waste.

CONVERTERS

(Continued from page 28)

carton permits standing it up for counter display. In addition, a tab on the back of the tray holds it in open position, thus keeping the glass bulbs in view. These cartons can also be used as stock drawers.

Kraft Bag Markings

CHICAGO — The following remarks are taken from a speech by H. C. Sackett, vice-president of Alton Box Board Co., delivered at a pre-convention meeting of the Mid-western Div. of the National Assn. of Waste Material Dealers, Inc., February 5:

"As you know, last March your president appointed a committee, with your speaker as chairman, to check with the paper shipping sack manufacturers and ascertain if these paper shipping sacks couldn't be market with an identifying symbol denoting whether or not these bags were fit for repulping purposes and I am happy to report that I have just received the good news that this work has now been completed and that all bags that can be used for repulping, bags that you can pack and ship with confidence that there will be no rejections or regradings, will be marked with an identifying octagonal symbol on the back of the bag, either under or over the freight classification stamp.

"The symbol will carry the letters 'A-N-K'—meaning *'All Natural Kraft.'* You can readily appreciate that it is not even necessary that your sorters be able to read, but can sort these good bags just by looking at them.

"In passing, may I give you this further information given to me by the Paper Shipping Sack Manufacturers' Assn., that due to the present inventory of paper sacks, either held under load or for use, that they expect the new sacks to be on the market sometime in June.

"I have been advised that the Paper Shipping Sack Manufacturers' Assn. will give this innovation complete coverage publicity through their entire sales organization and various customer trade channels, such as the bakery industry, sugar, etc.

"There is a great demand for this class of merchandise properly packed for repulping purposes. The industry is doing this job today but not satisfactorily. This, as you can vision, will permit you to do this job properly and expand present day tonnages. This will also be hailed by the paper and paperboard industry as one of the outstanding achievements toward improving the quality of waste paper that has taken place in the last decade.

"I am sure that we all recognize that paper shipping sacks employing a waterproofing agency such as asphalt, paraffin, plastic, foil, etc., are all necessary for the successful promotion of kraft bags. These have been a constant problem to both the packer and the consuming paper mill. With the adoption of this symbol, bags not bearing the 'A-N-K' octagonal should be thrown out and destroyed and only bags bearing the accepted symbol should be packed and shipped for repulping purposes."

Adjust Paper Products Restrictions

Finance Minister Douglas Abbott has announced that, due to the improvement in the foreign exchange outlook, all paper products at present on the prohibited list may, after April 1, be imported from non-schedule countries under open general permit and from scheduled countries on the basis of 50 percent of 1946-47 imports.

Admiral Container Leases Bldg.

NEW BRUNSWICK, N. J. — The Admiral Container Corp. has leased 75,000 sq. ft. of the building formerly occupied by the Federal Seaboard Terra Cotta Corp. at Fulton street and Cutter's Lane in Woodbridge township. The firm, which manufactures corrugated products, has a ten-year lease on the property and plans to make extensive improvements, including the installation of special machinery. When in full operation the company will employ approximately 120 persons.

Vincent Urquhardt, assistant vice-president and general manager of the firm, will be in charge of the Woodbridge plant. He was formerly general manager of the St. Joe Paper Co. in Hackensack.

Waxed Paper Plant For Florida

JACKSONVILLE, Fla. — Florida's first waxed paper manufacturing company will be located in Jacksonville, Zoltan Salkay, executive vice-president of the Capital Co., Inc., announced January 26.

The Austill Waxed Paper Co., a Florida corporation, has been formed to establish a manufacturing plant employing from 30 to 40 skilled laborers, Salkay said. William H. Austill of Oakville, Ont., Canada, president of Paper Converters, Ltd., and Arrow Paper Products, will head the Florida concern and will move here to manage the plant.

At present, there is no waxed paper manufacturer in Florida. The nearest such industry is in Atlanta. The paper is used for wrapping bread, meat, candy, frozen foods and in packaging. The industry will use paper obtained from Northern paper mills and will obtain wax from Baton Rouge, La. The plant will apply the wax to the paper and print the wrappings.

Financial arrangements were handled by Capital Co., a local organization which was formed approximately a year ago to help finance expansion of established local industries, as well as to help finance new industries. George W. Simons, Jr., is president.

and R. Eugene Orr, secretary-treasurer, of the company. Directors are John W. Donahoo, Gardner T. Gillette, John Moore, Roland M. Meyer, Clyde C. Pierce, Edward C. Roe, Franklin G. Russell, Ray J. Sheldrick, Ivy H. Smith and the officers.

Tidy-House Relocates

BROOKLYN, N. Y.—Tidy-House Paper Products, Inc., has announced its move to new larger quarters at 101 Onderdonk Ave., Brooklyn 6, N. Y.

Henley Purchases Somerville-Seybold

HIGH POINT, N. C. — The Henley Paper Co., High Point, N. C., has purchased Somerville-Seybold Paper Co., Atlanta, Ga. The operations of the Atlanta firm will continue without interruption, and the present staff of personnel will be retained without change. Effective immediately the Atlanta firm will be known as Somerville-Seybold Div. of Henley Paper Co. Charles F. Somerville, vice-president and sales manager, will continue to manage the plant which stocks a complete line of printing and industrial papers.

Army Awards Paper Contracts

WASHINGTON, D. C. — Contracts to two paper companies in excess of $100,000 were included in the latest list of contract awards by the Army for defense establishment requirements.

Walker, Goulard Plehn Co., New York City, received a contract totaling $137,974.63 for an unspecified quantity of typewriter paper; the other was to Hinsdale Paper Manufacturing Co. for $639,240, toilet tissue.

Garrett-Buchanan Election

PHILADELPHIA — A special meeting of the stockholders of the Garrett-Buchanan Co. was held January 31, for the purpose of increasing the number of directors on their board.

The present members are:—Morgan H. Thomas, president; Aimee K. Thomas; George W. Weaver, vice-president and manager; J. Ellwood Thomas, treasurer; C. Raymond Smith, vice-president and manager of Reading Branch. The newly elected directors are:—Frank H. Seltzer, vice-president and assistant manager; W. Harvey VanAken, assistant treasurer; George P. Orr, attorney. The company also has offices and warehouses in Reading, Lancaster, and Baltimore.

Strindmo Joins Bermingham & Prosser

KANSAS CITY, Mo.—The appointment of Ray A. Strindmo as sales manager of Bermingham & Prosser Co., has been announced by J. P. Bermingham, president. Mr. Strindmo joined Bermingham & Prosser Co., paper merchants, on February 1st after considerable mill and sales experience with Minnesota and Ontario Paper Co.

Mr. Bermingham said they are expanding their operations with additional personnel in sales, sales promotion and advertising departments and alteration of their office and warehouse facilities.

CENTRAL PAPER'S NEW BUILDING

Central Paper Co. of Newark and Trenton, N. J., announces the formal opening on March 11, of the firm's new office and warehouse building located at 40-52 Bellevue Ave., Trenton . . . The building is considered one of the most modern and efficient fine paper warehouses in the country. It contains approximately 18,000 sq. ft. of space on one floor, two floor level truck docks, and is served by a siding of the Reading Railroad. Palletization of most of the paper stocked is made possible by the use of a 4,000 lb. capacity Tow-motor lift truck.

NAVIGATION

N. E. Navigation and Power Plans

HOLYOKE, Mass. — The Board of Army Engineers today took under advisement a proposed $31,756,000 navigation and power project on the Connecticut River that might spell cheaper costs for raw materials for Holyoke paper manufacturers.

The Engineers began studying all of the data after 75 persons from Connecticut and Massachusetts (including more than a dozen representatives of paper manufacturing concerns) presented arguments for and against the big project, already approved by the division engineer. There was no indication how soon the board will make its recommendation. If it favors it, Congress would have to authorize the work and provide the money.

Specifically, the project envisions deepening the existing 15-foot channel from Long Island Sound to Hartford to 16 feet; providing a new 12-foot channel from Hartford to Holyoke; providing a 56-foot-wide by 360-foot-long lock and dam at the foot of Enfield Rapids, and providing for a 42,000-kilowatt power installation at the Enfield Dam.

Proponents estimate annual maintenance and operations cost of such a project at $1,810,600, and annual savings at $3,360,000. Backers of the power project estimate it would provide 42,000 kilowatts of dependable capacity during peak load periods, and an average annual net output of 237,000,000 kilowatt hours with an estimated benefit of $2,140,000.

Immediately following the hearing, House Majority Leader John W. McCormack indicated he would push the Connecticut River project, pointing out that it is "right in line with the national administration's ideas of further development of New England River basins."

Mr. McCormack said that President Truman had declared in his State of the Union message that there is need for development of New England rivers as sources of power, adding that he would work for speedy action in the House on any legislation that would further this end.

C. Girard Davidson, assistant Secretary of the Interior, and the President's chief adviser on river development, also seized upon the project as an occasion to state that private enterprise cannot suitably utilize the New England power potential, and that only by complete governmental control and development of the entire watersheds of the region's streams can this be done.

While navigation on the Connecticut long has been considered advantageous to paper manufacturers here, the project was not endorsed by all paper officials.

Speaking at the hearings for three paper manufacturing companies in this city was E. C. Tucker, vice-president of Chemical Paper Manufacturing Co., who expressed considerable anxiety about the future of his company, Newton Paper Co., and American Writing Paper Co., should the development proceed and the water level be raised.

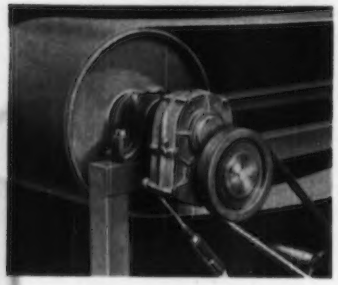
"These three mills are small businesses," he said, "but we've been there a long time. Raising the water level will make our businesses suffer very much. We don't want to stand in the way of progress, but we want the paper mills to be compensated for their economic loss."

NEW EQUIPMENT

Torque-Arm Speed Reducer

The Torque-Arm Speed Reducer mounts directly on the shaft to be driven and, according to the manufacturer, eliminates the necessity for special engineering. Designed as a *package* item to be available from distributors' stocks for conveyors, bucket elevators, agitators, mixers, feeders, etc. Unit consists of a re-

ducer with a fixed ratio of 15 to 1, driven by a motor through any V-belt or flat belt drive. Through the use of stock sheaves, any desired output speed can be obtained from 13 to 133 r.p.m., it is stated. The reducer, which contains a double train of helical steel gears, heat-treated and shaved, is locked to the shaft on both sides of unit by steel locking collars. A bushing keyed into the sleeve adapts it to any desired shaft size. A torque arm anchors the reducer and provides quick, easy adjustment of the belt tension through use of a turn buckle, it

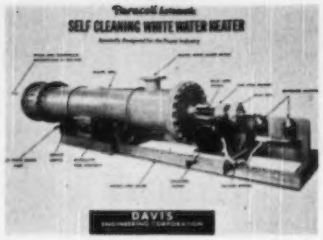


is stated. Whenever it is required to prevent reversal of the load, a backstop is available for installation on the input shaft. The reducer is available in six sizes with capacities to 28.5 h.p. For Bulletin A-470 and prices write to Dodge Manufacturing Corp., Mishawaka, Ind.

White Water Heater

The White Water Heater, automatic self-cleaning, is adapted for continuous operation processes and was specially designed for the paper industry. It also has an application wherever heater tubes must be kept constantly clean in a process operation, the manufacturer states. Unit is of shell and tube design with a tube bundle of the bayonet type. Since expansion or contraction of the tubes cannot be transmitted to the shell, the necessity for expansion rings or a floating tube sheet head is eliminated. A second inner-tube bundle also is free to expand or contract. *Working* of the heater is described as simple. The transverse heater baffles, which also serve as tube surface cleaners, are connected by tie rods to the yoke plate which, in turn, is connected to drive mechanism. Time controls close the motor circuit at predetermined intervals. The yoke plate moves each baffle longitudinally along the tubes until the drive mechanism reverses the action and returns the baffles to their original position. In this manner every inch of tube is thoroughly cleaned at every cycle.

Operation also is simple. The material to be heated or cooled enters the shell of the exchanger at the end where the tubes are expanded into a tube sheet or plate. Because of the baffles, the liquid must flow trans-

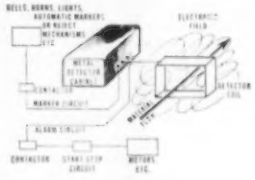


versely over each tube in the bundle. The medium for heating enters through a connection in the chamber head, is distributed to each inner tube, and must travel the full length of the inner tubes before it comes in contact with the heat transfer surface which is the outer tube bundle. It then flows counter-current to the liquid in the shell. Condensate, or cooling medium leaves the outer tubes and collects in a chamber immediately back of the tube sheet where it can be discharged through the side outlet connection.

Depending upon its characteristics and composition, the liquid being heated will deposit material on the surface of the outer tube bundle where it would accumulate and proportionately reduce the rate of heat transfer. Regular operation of the cleaning device removes the deposit, which is carried off by the liquid. If necessary, it can be filtered out before continuing to the next operation. For details and prices, write to Davis Engineering Corp., 1064 East Grand street, Elizabeth, N. J.

Electronic Metal Detector

An electronic metal detector designed to detect metal of any kind in non-metallic materials such as rubber, limestone, lumber, textiles, etc., has been marketed. Equipment consists of



(1) detector or search coil, usually custom built to surround the material flow in the inspection area; (2) a water-tight metal control cabinet housing electronic and control relays, which are mounted in any location within reasonable distance for connection to the search coil. Controls are designed to permit adjustment of sensitivity for detecting either large or small pieces of metal or both. For detection of tramp metal, the product is conveyed by belt to the search coil where it enters an electro-magnetic field. If foreign metal is present, detector will automatically stop the belt or operate mechanical, audible or visual signal devices such as a reject arm, horn, bell, flashing light, or marking device, it is stated. (Selection of the signal or making device depends upon the application involved.) Minimum size of metal particle detectable is generally dependent upon the size of the search coil and the "product effect" of the material being handled. Adjustment can be made to detect the particular size of metal that is causing trouble. Unit operates effectively on belt speed to 900 feet per minute and where magnetic separation cannot be obtained, the manufacturer states. Search coil and frame are adjustable in two dimensions to the conveying system. For details and prices, write to Eriez Manufacturing Co., 1332 East 12th street, Erie, Pa.

NEW LITERATURE

American Management Assn., 330 West 42nd St., New York 18, N. Y. Packaging Series Number 29, "Technical Developments In Packaging. Plastic Bonding Techniques, Insect-Free Packaging and Packaging Uses of Polyethylene." Price 50c. Number 30, "Improving the Efficiency of Packaging Production. With A Paper on the Outlook for Packaging Materials." Price 75c. Number 31, "Cost Reduction In Materials Handling and Shipping. Handling Techniques and Equipment Packaging and Packing for Shipping." Price $1.

Buffalo Electro-Chemical Co., Inc., Station B, Buffalo 7, N. Y. Booklet, "Hydrogen Peroxide Solutions." Contains a compilation of physical data and properties of hydrogen peroxide, its reactions in organic and inorganic chemistry and its applications and uses.

Chain Belt Co., 1600 West Bruce St., Milwaukee 4, Wis. Bulletin 50-6, "Baldwin-Rex 'BA' Assembly Riveted Roller Chains." Includes construction diagrams, list prices, specifications and dimensions.

The Cooper Alloy Foundry Co., Hillside 5, N. J. 1950 Reference Chart, "Stainless, Corrosion and Heat Resistant Alloy Castings." Covers alloy designations, applications, properties and analyses.

De Laval Steam Turbine Co., Trenton 2, N. J. Bulletin G-WB, "Imo-De Laval Worm Gear Speed Reducers." Illustrates and describes available types. Gives standard specifications including horsepower and overhung load ratings.

Economic Cooperation Administration, 800 Connecticut Ave., N. W., Washington 25, D. C. To assist American small businessmen to locate potential markets for their products abroad, the Office of Small Business of the ECA has published a directory of ECA-financed importers in the Marshall Plan countries. Issued in three volumes, it contains names and

addresses of importers and the products in which they apparently trade, as follows: Volume I, Food, feed and fertilizer; fuel; miscellaneous and unclassified products. Volume II, Raw materials. Volume III, Machinery and vehicles.

Factory Mutual Engineering Div., 184 High St., Boston 10, Mass. Booklet, 24 pp., "Prevention of Fire In The Home." Deals with the problem of home fire safety—selection of types of extinguishers, planning safety of occupants and how fires should be fought.

The Foxboro Co., Foxboro, Mass. Book, "Principles and Practice of Flow Meter Engineering." A new and enlarged edition, the seventh since the book was first published in 1930. Contains 416 pages of text and illustrations. Price, $7.

Gates Engineering Co., P. O. Box 1711, Wilmington, Del. Brochure, "Gaco Vinyl Finishes and Coatings." Describes applications for industrial, maintenance and marine uses.

General Electric Co., Schenectady 5, N. Y. GEA-5426, "Tri-Clad High-Speed Synchronous Motors." Lists applications, discusses construction features and mechanical modifications. Covers types: TS-3 Phase, QS-2 Phase and 20 HP-1500 HP.

Graver Water Conditioning Co., Dept. 148, 216 West 14th St., New York 11, N. Y. Paper, "Operating Experiences With Resin Zeolites on the Hydrogen Cycle." Presents operating data from several commercial hydrogen zeolite installations, explains the applications of acid-regenerated zeolites and discusses the various factors involved in establishing conclusions as to the effectiveness of this method of water softening, including silica removal.

Greene, Tweed & Co., North Wales, Pa. Illustrated Bulletin LP-10, "Palmetto R Self-Lubricating Packings." Covers the principles of self-lubricating packing design, structure performance, and an analysis of each individual packing from standpoint of application to specific services.

Hewitt-Robins, Inc., Robins Conveyors Div., Passaic, N. J. Bulletin No. 132, "Hewitt-Robins Sectional Conveyors." Sales copy with illustrations.

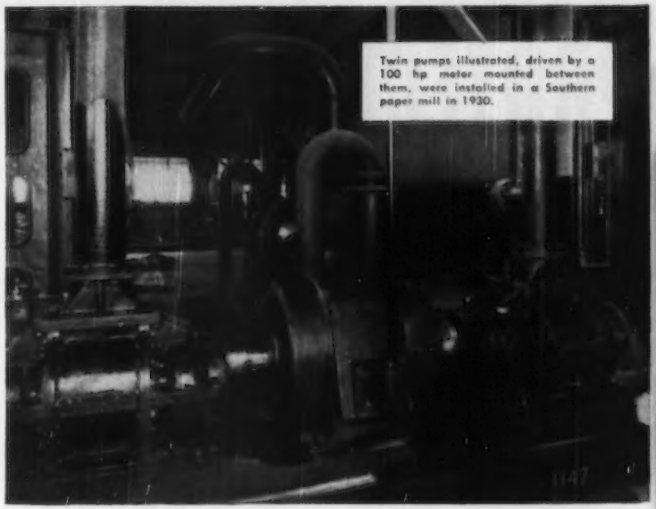
The Harco Corp., Rusta Restor Div., Cleveland 15, Ohio. Brochure, "Stop Steel Tank Rust With Rusta Restor." Shows how maintenance costs can be cut and rust problems solved.

International Textbook Co., Scranton, Pa. Book, 118 pp., indexed, price $2.75, "Practical Report Writing." Outlines instructions on basic thinking and actual preparation of reports. Shows how good business reports help a man get his work done and how they can help him get ahead in his job.

International Engineering, Inc., Dayton, Ohio. Catalogue No. 120, "Chemical Processing Equipment." Technical data on manufacturer's line of liquid and dry process mixers. Bulletin No. 103, "Fans." Gives capacity and performance ratings and specifications on all types of fans. Bulletin No. 104, "Mine Fans & Axial Blowers." Includes drive arrangements, blower dimensions, capacities and data on mine fans. Bulletin No. 109, "Duct Boosters, Stack Fans." Illustrates and describes construction and applications.

Machinery & Allied Products Institute, 910—17th St., N.W., Washington 6, D. C. Manual, 75 pp., "M.A.P.I. Replacement Manual." A new guide to determine when a machine is economically dead and due for replacement; the result of more than three years of research by George Terborgh, Institute Research Director, and a group of equipment manufacturers. Presents a "replacement formula" with practical instructions for its application in an industrial company.

South Florida Test Service, 4201 N. W. 7th St., Miami 34, Fla. Illustrated Pamphlet, "Tomorrow's Products Tested Today." An aid to industry in producing longer-lasting and better-looking materials and products. Includes service for manufacturers interested in merchandise consigned for use in South American and far Pacific areas.



Twin pumps illustrated, driven by a 100 hp motor mounted between them, were installed in a Southern paper mill in 1930.

HAVING SLIDE RULE TROUBLE?

If it concerns vacuum pumps, you'll find a solution in the ROOTS-CONNERSVILLE wide line of standard sizes.

Roots-Connersville has been supplying Vacuum Pumps to paper mills for many years, for use on suction rolls, flat boxes, and felt conditioners. Satisfied users long since discovered these important advantages:

High Volumetric Efficiencies—accurately maintained clearances, effectively sealed by water, insure high efficiencies; air being handled can be dry, or contain vapors or liquids.

Low Friction Losses—due to no contact between impellers or impellers and casings.

High Speeds—permitting direct connection to standard motors, saving first cost, space and weight.

Flexibility—to meet varying vacuum requirements; suction automatically created to overcome resistance in system.

Durability and Dependability—simplified design and construction for long-time, attention-free operation.

Solve your vacuum pump problems permanently by consulting with Roots-Connersville on any requirement, for new installations or replacements.

ROOTS-CONNERSVILLE BLOWER CORPORATION
502 River Avenue, Connersville, Indiana

ROOTS-CONNERSVILLE

BLOWER BUILDERS SINCE 1854

ONE OF THE DRESSER INDUSTRIES

PROTECT or PAY

You have no other choice!

Corrosion costs industry over $6,000,000,000 annually. No business escapes its effects. Attacks by acids, alkalis, salts, gases and atmospheric conditions cause untold damage that often is overlooked until too late.

Check the danger points in your plant — piping, machinery, walls and all other exposed areas. Most conventional coatings fail when corrosion threatens. That's why Amercoat is designed to give *extra protection* against surface failure. Highly resistant to a wide variety of chemicals, brines, fumes, weathering, abrasion, it is available in a number of formulas, *each designed to meet specific conditions.*

Be sure your plant and equipment are safe from corrosion damage. Protect now with Amercoat.

AMERCOAT CORPORATION
A Division of
American Pipe and Construction Co.
4809 Firestone Blvd., South Gate, California

AMERICAN PAPER AND PULP ASSOCIATION'S PAPER PRODUCTION RATIO REPORT

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

	Jan. 7	Jan. 14	Jan. 21	Jan. 28	Feb. 4
1950	94.3	100.4	100.7	‡99.4	99.9
	Jan. 8	Jan. 15	Jan. 22	Jan. 29	Feb. 5
1949	*94.1*	*94.7*	*95.2*	*94.3*	*93.1*

Capacity Base—183,384.

‡ Revised.

COMPARATIVE MONTHLY SUMMARIES

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1950	‡98.9												
1949	*94.6*	*92.8*	*89.1*	*85.1*	*82.7*	*78.6*	*72.8*	*87.6*	‡90.3	‡98.0	‡98.4	‡90.4	‡88.6

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1943	1944	1945	1946	1947	1948	1949	1950
Year to Date	87.4	88.7	86.4	95.4	103.7	100.6	94.7	98.9
Year Average	87.8	88.1	89.4	100.1	104.3	96.2	‡88.6	

PAPERBOARD OPERATING RATIOS†

	Jan. 7	Jan. 14	Jan. 21	Jan. 28	Feb. 4
1950	74	94	92	92	91
	Jan. 8	Jan. 15	Jan. 22	Jan. 29	Feb. 5
1949	*79*	*91*	*92*	*88*	*87*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1950	88												
1949	*88*	*85*	*79*	*79*	*78*	*75*	*61*	*86*	*87*	*94*	*93*	*83*	*83*

* All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

The Trumbull Electric Mfg. Co., Plainville, Conn. Catalog T.E.B.-1, 40 pp., "LVD-SAC Flex-A-Power." Provides construction, application and engineering data. Lists all LVD and SAC parts with instructions on how to specify, order, price and install.

U. S. Dept. of Commerce, Office of Technical Services, Washington 25, D. C. Report, PB-99220, 14 pp., "Low-Loss Arc-Resistant Paper Laminates." Describes preparation of the laminate, its impregnation and drying, flow and volatile tests, molding techniques and certain theoretical considerations involved in condensing the amine to the formaldehyde resin. Price 50c; orders should be accompanied by check or money order, payable to the Treasurer of U. S.

The Wilbur & Williams Co., Greenleaf & Leon Sts., Boston 15, Mass. Folder, "Chemical Resistant Coatings." Contains information on applications for maximum chemical, moisture and rust resistance in varied industries for all metal, concrete and wood.

OBITUARIES

Milton S. Fogerty, chief engineer of Sutherland Paper Co. died on February 9 at Kalamazoo. Mr. Fogerty was a member of the American Pulp and Paper Mill Superintendent's Assn. and of TAPPI.

Frederic Alan Schaff, 65, chairman of the board of Combustion Engineering—Superheater, Inc., died on February 7 following a protracted illness.

Levin P. Anders, 68, former head of the wood purchasing department of the Gulf States Paper Corp. for 23 years, died January 24 at Tuscaloosa, Ala. He is survived by his widow and two daughters.

Oscar Edward Wandtke, 70, foreman of the H. P. Neun Paper Box Co., Fairport, died Feb. 5. He had been associated with the paper box concern for 52 years.

Kenneth Huse, 59, retired general superintendent of the paper dicision at Kodak Park, died February 4. He joined Eastman Kodak in 1913. In 1924 he was named manager of the sensitizing division, and in 1936 general superintendent of the paper division. He is survived by his widow and two sons.

John B. Venturini, 66, representative for the Cameron Machine Co., Brooklyn, N. Y., died on February 4th. Mr. Venturini had been associated with Cameron since 1914. He was the company sales representative in Canada and New England for over thirty years. Since 1946 he has been at the main office in Brooklyn, handling special sales in the metropolitan and New Jersey area. He is survived by his widow, Iva Fitch Venturini and a daughter, Mrs. Geneva Speed.

CLEARING HOUSE

HELP WANTED

HELP WANTED

WANTED PAPER MILL SUPERINTENDENT

A six-machine division of a large Canadian paper company, located in a city, making bonds, ledgers, sulphite specialties, and light weight tissues. Man required must have managerial ability, in addition to practical experience in both paper machine operation and stock preparation. This position carries an attractive salary and is an exceptional opportunity for the right man. Give complete information concerning experience and education in your first reply. Reply Box 50-49, c/o Paper Trade Journal,

F-23

HELP WANTED

MEN WANTED
Positions Open

We can place managers, superintendents, assistant supts. and night supts. for mills making sulphite, groundwood, kraft, book, bond, ledger, mimeograph, offset, lightweight tissues, magazine, post card, cup stock and other papers, also for board mills.

Chemists and chemical engineers; foreman finishing and supercalenders on coated papers; A-1 color man to take charge of beaters and color matching; salesmen for folding cartons, wire cloth, waxed paper and cellophane products, also for chemicals and specialties for paper mills.

Master mechanics, plant engineers and chief draftsman for positions paying up to $12,000; laminating operator capable of being supervisor; machine tenders, back tenders, beater engineers.

We invite correspondence (confidential) with executives seeking positions and with employers seeking new personnel.

CHARLES P. RAYMOND SERVICE, Inc.
294 Washington Street, Boston, Mass. F-16

NEW PRODUCT DEVELOPMENT—ENGINEER

"Paper manufacturer and converter wants top grade man to head up new department. Must have successful background in all types of paper converting such as wax paper, dinner napkins, facial tissue, toilet tissue — thorough knowledge of automatic machinery and equipment required, sources of supply of such machinery, thorough knowledge of how to set up and operate an entire converting operation and to take over job of developing new products, including market analysis, potential volume, development of quality, costs, size and forms, packaging and final production.

If you do not have the proper experience, please do not waste your time and ours by applying. Replies will be held in strict confidence." Address Box 50-74, care Paper Trade Journal.

F-16

PAPER MAKER WANTED

Large Eastern paper mill has an exceptional opening at the Supervisory level for a practical, highly skilled paper machine operator. This young man will have established an outstanding operating record in his present job. He has proven his resourcefulness, initiative and ability and is seeking a new connection primarily because of the increased opportunity and compensation our opening will bring him.

He must have the education, training and experience to assume full responsibility for the operating efficiency and product quality of several large machines. Book paper experience preferred but not essential.

This is a big job and a splendid opportunity for the right man. Give complete information in your reply to Box 50-92 care Paper Trade Journal. F-16

SALARIED POSITIONS $3,500—$35,000

If you are considering a new connection communicate with the undersigned. We offer the original personal employment service (40 years recognized standing and reputation). The procedure, of highest ethical standards, is individualized to your personal requirements and develops overtures without initiative on your part. Your identity covered and present position protected. Send only name and address for details.

R. W. BIXBY, INC.
117 Dun Bldg., Buffalo 2, N. Y.

TF

WANTED—First class Machine Tender experienced on test liner and folding boxboard. Good wages. Mill in Central State. Give full details of experience. Address Box 50-68 care Paper Trade Journal. M-2

Established manufacturer of molded paper pulp items looking for experienced plant foreman. Must have thorough manufacturing knowledge. Excellent salary and opportunity. Write detailed letter to Robert Robinson, William J. Boas & Co., 16th & Hamilton Sts., Phila. 30, Pa. F-16

FIRST-CLASS MACHINE TENDER WANTED

Good opportunity for aggressive man having full knowledge and experience on straight Fourdrinier paper machine, manufacturing .009 corrugating medium, tube stock and light weight specialties. To be in complete charge of paper machine while on tour. State age, machine experience and salary. Address reply to:

Watteonsac Paper Mills, Inc.
P. O. North Hoosick, New York M-2

SALES REPRESENTATIVE

SALES REPRESENTATIVE

Prominent manufacturer of paper machine clothing has opening for sales trainee.

We need a young man with initiative, good personality, appearance and moderate habits.

Should have experience on paper machines and must be willing to travel.

Send detailed application with photo to Box Number 50-72, care Paper Trade Journal.

F-16

RATES FOR CLASSIFIED ADVERTISING

HELP WANTED—10c a word. Double rate for heavy face type. Minimum charge $2.50.

SITUATIONS WANTED—10c a word, double rate for heavy face type. Minimum charge $2.50. If repeated ½ rate will be charged for each consecutive repetition.

FOR SALE—10c a word. Double rate for heavy face type. Minimum charge $2.50.

WANTED—10c a word. Double rate for heavy face type. Minimum charge $2.50.

OPPORTUNITIES—10c a word Double rate for heavy face type. Minimum charge $2.50.

Classified advertising space may also be purchased at $5.00 per single column inch. All classified advertisements are payable in advance. If box number is used—70 cents additional.

Address replies to advertisements appearing under Box Numbers in care of PAPER TRADE JOURNAL, 15 West 47th Street, New York 19, N. Y.

HELP WANTED

FOLDING BOXBOARD SALESMAN

An excellent opportunity for an experienced man, in the Metropolitan New York or Philadelphia area. Mill capable of making all grades of folding boxboard. Only applicants outlining full qualifications will be considered. Drawing account. Address Box 50-90, care Paper Trade Journal. F-23

WANTED

MANAGER for a new laminating division of a large Mid-Western board mill. Must have knowledge of converting operations, sales experience and executive ability. Address Box 50-59, care Paper Trade Journal. F-16

WANTED for New York and Pennsylvania, Southern and Middle Western Territories, representatives to sell imported paper machine wires. Apply with full particulars as to age and experience to Box 50-93 care Paper Trade Journal. F-23

ASSISTANT TO GENERAL SUPERINTENDENT—Four machine tissue mill, Fox River Valley, Wisconsin. Machine experience required. Address Box 50-63 care Paper Trade Journal. F-23

WANTED—Two or three experienced coating machine operators. Steady work. Good opportunities for advancement. New England location. Address Box 50-70 care Paper Trade Journal. F-16

SITUATIONS WANTED

MILL MANAGER

desires position with a progressive company. Has a practical and technical knowledge of kraft, sulphite and groundwood pulp manufacturing and their conversion into newsprint, kraft and sulphite specialty papers. Has a proven record of cost reduction methods, quality improvement and the ability to obtain maximum production from the equipment at hand. Practices friendly but firm labor relations. University graduate in chemistry plus additional university study in business administration.

If you are looking for a cost conscious and technically informed executive, in his late thirties, write to Box 50-85 Paper Trade Journal for full particulars and references. F-23

EXECUTIVE, many years experience with jobbers and consumers of Metropolitan District, best contacts with buyers of grocery chains, dairies and ice cream manufacturers, seeks position as mill representative. Address Box 50-75, care Paper Trade Journal. F-16

PAPER BAG SUPERVISOR—27 years practical experience. Manufacture Kraft, Glassine, dry wax, some wet wax. Good production. Best of References. Age 45. Change due to working conditions. Address Box 50-73, care Paper Trade Journal. F-23

SWEDISH MECHANICAL ENGINEER — 31, with 7 years experience mill layout and construction, installation, paper and board mills; specialty high quality Leather Board, etc., seeks suitable position. Immediately available. Address Box 50-82 care Paper Trade Journal. F-16

GRADUATE CHEMIST—Nine years experience in research and technical control, including pulping, bleaching, papermaking and paper treatment. Desires position with aggressive expanding organization. Address Box 50-86 care Paper Trade Journal. M-2

SITUATIONS WANTED

GENERAL SUPERINTENDENT — 30 YEARS PRACTICAL AND TECHNICAL EXPERIENCE—Cylinder and Fourdrinier Machines, all kinds of high grade folding Box Board and Kraft Specialty Board, Sulphate, Sulphite, groundwood, de-inked papers. Good organizer, can teach help, excellent labor relations, cost and quality conscious. Best of references. Address Box 50-38 care Paper Trade Journal. F-16

PLANT MANAGER—Board and Paper Conversion; employed; seeks opportunity in company needing cost-minded executive with proven production record and excellent labor relations history. Address Box 50-8 care Paper Trade Journal. F-23

FOR SALE

FOR SALE

NEW 10,000 KW TURBO GENERATOR MANUFACTURED BY GENERAL ELECTRIC:

Turbine Rating: 10,000 KW, 15 Stages, 3600 RPM, 600# normal, 650# maximum 750° F. normal, 775° maximum, 3" Hg Abs. Exhaust, automatic HP Extraction and admission 150#–235# G., Automatic LP. Extraction and admission 10#220# G.

Generator Rating: 12,500 KVA, .8P.F., 13,800 volts, 3 phase, 60 cycles, complete with exciter 45 KW, 250 volts, 3600 RPM.

Condenser Rating: Lummus Co., 130,000#/Hr. 16,300 Sq. Ft. condensing surface, complete with accessories.

This equipment is boxed for export and is presently stored in the dock area New York City. It weighs approximately 176 Gross shipping tons, measures approximately 8,600 cu. ft. Available for immediate shipment. Address Box 50-84, care Paper Trade Journal. F-16

CURRENT OFFERINGS

58" Finley Single Knife Sheeter.
82" Hamblet Sheeter with Layboy.
No. 9 Cameron Slitter.
3-color Rotary Web Press, 60" cyl.
55" 9-roll Super Calendering Machine.
Model 145 Economy heavy duty Baler.
32", 38", 40" and 44" Power Cutters.
NEW Back-Stands, made to special order.
Motors—from fractional to 30 H.P.

THOMAS W. HALL COMPANY, Inc.
120 West 42nd St., New York 18.
(Plant at Stamford, Conn.)
TF

FOR SALE

106" Beloit 3 sets press roll stations: 106"—2 bar slitter: 7 pairs mill stands with controls for 72" diam. rolls with 78" & 106" shafts: 74" Knowlton cut-off knife; 49" x 66" and 46" x 62" Miehle printers and die cutters: 26" x 38" and 28" x 41" Thomson platen die cutters: 72" Cottrell die cutter. Write for listings on over 90 paper converting and paper boxmaking machines available. Address Box 50-40, care Paper Trade Journal. TF

FOR SALE

110" SLITTER AND REWINDER. GOOD CONDITION.
ADDRESS BOX 50-89 CARE PAPER TRADE JOURNAL
F-16

FOR SALE

1—Paper Converting Machine Co. 4-Web Dispenser Type Napkin Folder. Production 100M per Hour.

1—Paper Converting Machine Co. ¼ fold, 2 web napkin folder with embossing attachment, Extra Embossing rolls.

CAMERON SLITTERS

1—72" Model 10-10A.
1—40" Model 4-B.
1—42" Type 26, Model 2A.
1—42" Type 40-T.
1—50" and 1—60" Type 28, Model 3D.
2—62" Type 9-5.
1—62" Type 10-5.
1—32", 1—42", and 1—62" Universal Type 6.
1—48" Inman Board Slitter and Rewinder. Rewinds 48" diameter rolls.
1—40" Langston Type A Shear Cut Slitter & Rewinder.
1—40" Model C Fales. Knife set-ups for ¾", 7/8" and 20 Adjustable Cutters. 5 HP AC Motor equipment.
1—32" New Johnstone Type 12 Slitter and rewinder. For narrow slitting down to ¼".
1—72" Type AA Langston shear cut slitter and rewinder, complete with 20 HP, A. C. motor equipment.
Power Paper Cutters: 6—Seybold—1—40" & 1—50"10Z, 54" Holyoke, 1—74" 20th Century, 84" 2-H, 1—44" Seybold Precision type cutter. 5—Oswego—34", 44", 50", 57" and 68". White — 1 — 40". 2 Acme, 32" and 42". 2—S&W Undercut—63" and 92".
3—Potdevin Flat & Square Bag Machines. Models 292, 294 and 391.
8—Potdevin Bag machines with two color printing units. 1—Type 293, size 9693-303, flat and square bags. 4—Type 212 Size 9112-301, satchel bottom and flat bags, 3—Type 91 F&S Size 1, Flat and square bags.
3—Model 30 Potdevin Sos Grocery Bag Machines. Range 1 to 10 lbs., inclusive.
2—Model BM 24 Manhasset Flat and Square Bag Machines. Maximum length of bag 5" to 20". Width of bag 1½ to 12¼. Electric eye on one machine. Also 1 Manhasset 4 color 24" aniline bag printing unit.
1—48" Miami lo-type Waxing Machine manufactured by Dilts Machine Works, with 1 refrigerating unit size 4" x 4".
1—45" German Dornbusch Embossing machine with two sets of embossing rolls.
1—50" Hudson-Sharp Model 8E Embosser. With two sets of embossing rolls.
1—57" Norwood 14 roll stack of Glassine Super Calenders. Complete with 60" wide dampener.
1—Kidder 36" x 48" variable sized cut to register spot sheeter.
1—45" Beck Rotary Sheet cutter.
1—64" Dillon Duplex Rotary Sheet cutter. With slitting attachment and 24 roll Double Deck backstands.
1—82" Hamblet Single Rotary Sheet Cutter with Slitting Attachment, Erie Automatic Layboy and 24-roll Double-deck Backstands.
1—Paper Converting Machine Co.'s single width towel folder, late model.
2—81" Dietz Toilet Paper Perforators. Sheets 4½ x 4½ and 4½ x 5 and paper towels perforated 7½ and 13½".
1—81" Hudson Sharp Toilet Perforator.
1—32" 3-color Aniline Printing Press for tailprinter on a Bag Machine.
1—31" and 1—41" 3 color Aniline Printing Presses. Roll to Roll.
2—#1 Dilts Hydrafiners with flexible couplings for direct connection to motors.
2—Bird Screens. One 3A and one 2A.
2—12" x 12" Beloit Triplex Plunger Stock Pumps.
1—Knapp Model K. W. Cellophane wrapping machine.
1—Logaman Baler, A. C. motor, bales 45" x 25" x 60".
Variable Speed Drives. 5—Reeves Size 4, Class E. 1—Reeves, Size 5, Class E. 1—Size 15 Llewlyn Drive.

GIBBS-BROWER COMPANY, INC.
21 East 40th St., New York 16, N. Y.

FOR SALE

FOR SALE

4 Knife 96" Murray Chipper

1—Left hand 96" roller bearing chipper with complete direct connected drive as follows

1—Synchronous Motor, 150 HP, 240 RPM, 440 Volts, 3 phase, 60 cycles, 80% leading power factor. Exciting volts, 125.

1—Control panel, full voltage starting. Field Rheostats, etc.

1—Separate exciter, 440 volts A.C., 125 Volts D.C.

This equipment is complete and ready to operate. (Prints sent upon request.) Box 50-76, care Paper Trade Journal. F-23

FOR SALE

"One Ferguson Packomatic Case Sealing Machine complete with all operating equipment. Adjustable for case sizes.

"Two E. D. Jones & Sons Majestic Jordans with Motors and Electrical Equipment.

"Noble & Wood Mill complete with 600 HP Induction Motor, Magnetic Controller and Extra Equipment.

A. P. W. Products Company, Inc., Albany, N. Y.

FOR SALE

FOR SALE

Late Type 44" Seybold Precision Power Paper Cutter. Perfect Condition. Immediate Delivery. Address Box 50-80 care Paper Trade Journal. F-16

FOR SALE

102" Warren Rewinder
Core Pipe Threading Machine 2½ to 12" Dies
Bagley & Sewall Wind Stand with Water Cooled Brake
2 Cabinet Laboratory Oven
Also large supply of rolls, brass, steel and rubber covered; Pulleys, both cast iron and steel and V-belt Sheaves.

EMPIRE BOX CORPORATION
STROUDSBURG, PENNA. M-2

FOR SALE

6,000 lbs. of Brand New Yarwick & Kenwood Paper Machine felts, top, botton, press and wet machine, from 17' x 65" to 67" x 118". Can you use them? Address Box 50-81 care Paper Trade Journal. F-16

FOR SALE—Lockport Bundling Press for flat and square bags $50.00 — F.O.B. Phila. JOSEPH J. MELLWIG, 4428 Frankford Ave., Phila., 24, Pa. F-16

FOR SALE—Cameron 72" wide Roll Slitter and Rewinder, Motor and Knives. Ready for immediate delivery. Price very low. THEO. ADAMS, 111 W. WASHINGTON STREET, CHICAGO, ILLINOIS. M-2

FOR SALE

PAPER COATING MACHINERY MANUFACTURERS — Waxing, Oiling, Carbon, Laboratory Coating and Treating Machines. New improvement. MAYER MACHINE COMPANY, Inc., 1313 Buffalo Road, Rochester 11, N. Y. TF

WANTED

WANTED — Brightwood Box Machine. Address Box 50-17 care Paper Trade Journal.

PAPER MANUFACTURER desire to purchase or invest in converting business of standard paper products. Address Box 50-16 care Paper Trade Journal. TF

WANTED—W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic presses, Sheridan Presses, Dryers. Address Box 50-13 care Paper Trade Journal. TF

WANTED—Good used Sheeter with layboy not over 40". Forward full particulars. Address Box 50-91 care Paper Trade Journal. F-23

WANTED—60" or 62" Langston, or other make, Roll Paper Slitter and Rewinder Shear Cut. Send full description. Address Box 50-83 care Paper Trade Journal. M-2

WANTED—62" to 72" Sheeter—10 roll back stand; 62" to 72" Cameron Model 9 or 10; 1 Flat Cutter. Late models in good condition. Address Box 50-88 care Paper Trade Journal. F-16

CLASSIFIED ADS BRING RESULTS

THE PROGRESS OF PAPER

Papyrus to Parchment to Paper 2000 B.C. to 1947 A.D.

Brief Summary of Contents

Map of origin of paper, Egypt to the Near East. Also map of area of invention and progress of production. Illustrated with drawings and photographs of actual material, some of ancient origin, dating from 2,000 B.C. to 1300 A.D.

European development.

Spain, Italy, Greece, France, Belgium, Holland, Germany, Poland, Russia, England, to 1800 A.D.

Invention of machines, expansion in Europe with many odd facts to 1850 A.D.

Advancing mechanical progress brings more inventions abroad—to 1875 A.D.

American phase of transition, 1690-1775.

Improvements of paper in America after the Revolution.

An infant industry gradually becomes larger—development of American mills, 1800-1850.

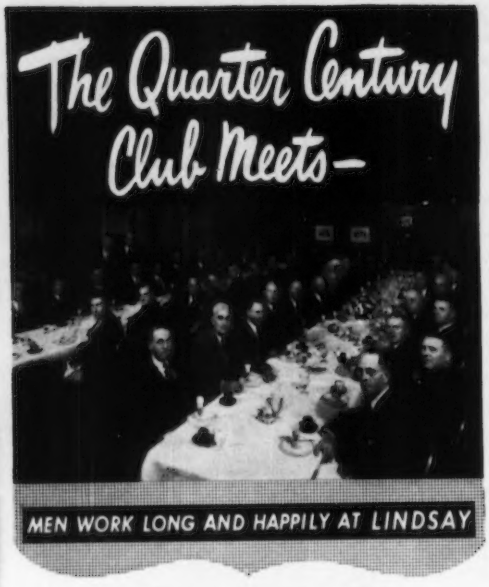
—and many other subjects.

ORDER YOUR COPY TODAY—

De Luxe Edition bound in blue cloth—$12.50

THE LOCKWOOD TRADE JOURNAL CO., INC.

15 West 47th St., New York 19, N. Y.



THE LINDSAY WIRE WEAVING COMPANY
14001-14299 ASPINWALL AVE., CLEVELAND 10, OHIO

PRICE & PIERCE
LTD.

Wood Pulp and Paper Agents

60 E. 42 ST., N. Y. 17

WHERE TO BUY

ABRASIVES
Monsanto Chemical Co.
Nopco Chemical Co.
Norton Co.

ACCUMULATORS, ACID
Chicago Bridge & Iron Co.

ADHESIVES
American Anode Incorporated
American Paper Machy. & Engrg. Works, Inc.
E. I. Du Pont De Nemours & Co., Inc.
The Goodyear Tire & Rubber Company
Monsanto Chemical Co.
National Starch Products, Inc.
Nopco Chemical Co.

AGITATORS
Appleton Machine Co.
Dilts Machine Works, Inc.
Dorr Company
Downingtown Mfg. Co.
Hardinge Company, Inc.
E. D. Jones & Sons Co.
D. J. Murray Mfg. Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

ALLOYS
Michigan Steel Casting Co.

APRON CLOTH
Williams-Gray Co.

BAG MACHINES
Potdevin Machine Co.
Smith Winchester Mfg. Co.
Weber, Herman G., & Co., Inc

BARKERS AND CHIPPERS
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Carthage Machine Co.
Chicago Bridge & Iron Co.
D. J. Murray Mfg. Co.
Valley Iron Works Co.

BARS
E. D. Jones & Sons Co.
The Moore & White Co.
Shartle Brothers Machine Co.
Stephens-Adamson Mfg. Co.
Valley Iron Works Co.

BASIC WEIGHT SCALES
Thwing-Albert Instrument Co.

BEARINGS
E. D. Jones & Sons Co.
Link Belt Company
Magnus Metal Corp.
The Moore & White Co.
Shartle Brothers Machine Co.
Timken Roller Bearing Co.
Valley Iron Works Co.

BEATERS AND JORDANS
American Paper Machy. & Engrg. Works, Inc.
The Appleton Machine Co.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Morden Machines Co.
J. J. Ross Company
Ross Paper Machy. Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

BED PLATES
Bahr Brothers Mfg. Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Lukenweld, Div., Lukens Steel Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

BELTING
Alexander Brothers
Allis-Chalmers Mfg. Co.
The Cincinnati Rubber Mfg. Co.
The Goodyear Tire & Rubber Company
Link Belt Company
I. E. Rhoads & Sons

BLEACHING AGENTS
E. I. Du Pont De Nemours & Co., Inc.
General Dyestuff Corp.
Rohm & Haas Co.
Virginia Smelting Co.

BLEACHING BOILERS, ROTARY
The Bigge Boiler Works Co.

BLEACHING APPARATUS
E. D. Jones & Sons Co.
Perkins & Son, Inc., B. F.
Moore & White Co.
Niagara Alkali Co.
The Sandy Hill Iron & Brass Works

BLOW PIPES & PITS
Carthage Machine Co.
Chicago Bridge & Iron Co.
Kalamazoo Tank & Silo Co.
Moore & White Co.
Murray Mfg. Co., D. J.
Walworth Company

BOILERS
Babcock & Wilcox Co.
The Bigge Boiler Works Co.

BOTTOMS
Kalamazoo Tank & Silo Co.
Valley Iron Works Co.

BOXBOARD SCALES
Thwing-Albert Instrument Co.

BRUSH ROLLS
M. W. Jenkins Sons, Inc.

BRUSHES
M. W. Jenkins Sons, Inc.

BURSTING TESTERS
B. F. Perkins & Son Inc.
Testing Machines, Inc.

CALENDERS
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Lobdell Co.
Edward J. McBride
The Moore & White Co.
Perkins & Sons, Inc., B. F.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

CARBON BLACK
Huber Corp., J. M.
United Carbon Co.

CARRIER ROPE
Williams-Gray Co.

CASEIN
American Cyanamid Co., Industrial Chem. Div.
Hercules Powder Co.

CASTINGS
American Cast Iron Pipe Co.
Appleton Machine Co.
Babcock & Wilcox Co.
Carthage Machine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Hamblett Machine Co.
Hardinge Company, Inc.
Lobdell Co.
Magnus Metal Corp.
Michigan Steel Casting Co.
The Sandy Hill Iron & Brass Works

WHERE TO BUY

Smith & Winchester Mfg. Co
Valley Iron Works Co.
Walworth Company

CENTRIFUGAL MACHINERY

Bird Machine Co.
Ross, J. O., Engrg. Co.

CHAINS

Link Belt Company

CHEMICAL COTTON PULP

Hercules Powder Co.

CHEMICALS

American Anode, Incorporated
American Cyanamid Co., Industrial Chem. Div.
Calco Chemical Co.
Calgon, Inc.
Cowles Chemical Company
Diamond Alkali Co.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuffs Corp.
Geigy Co., Inc.
Gottesman & Co.
Hercules Powder Co.
Hooker Electrochemical Co.
The Kinsley Chemical Company
Monsanto Chemical Company
National Aluminate Corp.
Niagara Alkali Company
Nopco Chemical Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Rohm & Haas Co.
Solvay Sales Corp.
Virginia Smelting Co.
Wyandotte Chemical Corp.

CHESTS

E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.

CLEANING MATERIALS

Amer. Cyanamid & Chem. Corp.
Cowles Chemical Company
The Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuff Corp.
Monsanto Chemical Company
Nopco Chemical Co.
Pittsburgh Plate Glass Co.
Solvay Sales Corp.
Wyandotte Chemicals Corp., J. B. Ford Division

CLUTCHES

Appleton Machine Co.
Farrel-Birmingham Co.
Hardinge Company, Inc.
Hudson Sharp Machine Co.
Rodney Hunt Machine Co.
Link Belt Company
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works

COATING MACHINERY

Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Hudson Sharp Machine Co.
The Mayer Machine Co., Inc.
Moore & White Co.
Potdevin Machine Co.
Waldron Corporation, John
Weber, Herman G., & Co., Inc.

COATING MATERIALS

American Anode Div.
E. I. Du Pont De Nemours & Co., Inc.,
The Goodyear Tire & Rubber Company
Hercules Powder Co.
Monsanto Chemical Company
Nopco Chemical Co.

COATING, WAX

National Wax Co.

COGS

The N. P. Bowsher Co.

COMPOUNDED LATICES

American Anode Div.

COMPRESSORS

Allis-Chalmers Mfg. Co.
Nash Engineering Co.

CONDENSATE FILTERS

Hungerford & Terry, Inc.

CONSISTENCY REGULATORS

Bird Machine Company
DeZurik Shower Company
Paper & Industrial Appliances

CONSTRUCTION CONTRACTORS

C. M. Guest & Sons

CONSULTING ENGINEERS

Birk, F. Paul
Ebasco Services
Frank W. Egan & Co.
Ferguson Co., H. K.
Ferguson, Hardy S.
Gibbs, Ralph
Alvin H. Johnson & Co., Inc.
Main, Inc., Chas. T.
Roderick O'Donoghue
The Rust Engrg. Co.
J. E. Sirrine & Co.
John Waldron Corp.
H. G. Weber & Co., Inc.

CONTROLLERS

Askania Regulator Company
The Bristol Co.
The Brown Instrument Co.
Cochrane Corp.

CONTROLS

Askania Regulator Company
The Bristol Company
The Brown Instrument Co.
Johnson Corp.
Stickle Steam Specialties Co.

CONVEYORS

Industrial Brownhoist Corp.
Link Belt Company
Murray, D. J., Mfg. Co.
Ross Engineering Corp., J. O.
Shartle Brothers Mch. Co.
Stephens-Adamson Mfg. Co.

CORES

Eliaman Paper Co.
Rodney Hunt Machine Co.
Smith & Winchester Mfg. Co.
Sonoco Products Co.

CORROSION RESISTANT

Amercoat Corporation

COUPLINGS

Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Link Belt Company
Moore & White Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works
Waldron Corp., John

CRANES

Cleveland Crane & Engrg. Co.
Industrial Brownhoist Corp.
Link Belt Company
Whiting Corp.

CURL TESTER

Thwing-Albert Instrument Co.

CUTTERS

Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hamblet Machine Co.
Moore & White Co.
Perkins & Son, Inc., B. F.
The Smith & Winchester Mfg. Co.
Taylor, Stiles & Co.

Are you using the best starches for your purpose?*

Put our technical service division to work for you

The development of "tailor-made" starches to fit certain production needs is just one of the ways our technical service division works for you. Backed by unsurpassed starch chemistry research this technical service can be extremely valuable in your production problems. No obligation.

Depend on these quality products... Globe Starch for the beaters and for enzyme conversion; AMIJEL for the beaters; CORAGUM for corrugating; and LAM-O-DEX for laminating.

CORN PRODUCTS
REFINING COMPANY

17 BATTERY PLACE • NEW YORK 4, N. Y.

*GLOBE, AMIJEL, CORAGUM and LAM-O-DEX are registered trademarks of Corn Products Refining Company, New York, N. Y.

WEST VIRGINIA PULP and PAPER COMPANY

230 Park Ave.
New York 17, N. Y.

35 East Wacker Drive
Chicago 1, Ill.

Public Ledger Building
Philadelphia 6, Pa.

503 Market St.
San Francisco 5, Calif.

Manufacturers of West Virginia Mill Brand Papers

SUPERCALENDERED
ENGLISH FINISH
LITHOGRAPH
LABEL
OFFSET
EGGSHELL
MUSIC
POSTER
BOND
WRITING

ENVELOPE
MIMEOGRAPH
INDEX BRISTOL
POST CARD
COVER
CUP AND CONTAINER
FILE FOLDER
TAG
COATED
MACHINE COATED

KRAFT CONVERTING AND KRAFT ENVELOPE
KRAFT LINER BOARD

MILLS

Mechanicville, New York
Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Charleston, South Carolina

We specialize in the manufacture of new complete Water Filtration Plants and the overhauling, rebuilding and modernizing of old existing Water Filtration Systems

Attractive Prices
Complete Guarantees
Prompt Deliveries
Over 50 Years Experience

Other equipment includes Coagulators, condensate De-Oiling filters, Inversand zeolite water softeners, de-mineralizers and all types of water conditioning apparatus.

HUNGERFORD & TERRY, INC.

CLAYTON, NEW JERSEY
(Representatives everywhere)

WHERE TO BUY

CYLINDERS
Automatic Regulator Company
M. W. Jenkins Sons, Inc.
National Tube Co.

DAMPENERS
Perkins & Son, Inc., B. F.
Valley Iron Works Co.

DECKLE WEBBING
Williams-Gray Co.

DE-INKING
General Dyestuff Corp.
Kinsley Chemical Co.
Roderick O'Donoghue

DEINKING CHEMICALS
E. I. Du Pont De Nemours & Co., Inc.
General Dyestuff Corp.
Kinsley Chemical Co.
Monsanto Chemical Company

DE-MINERALIZING EQUIPMENT
Hungerford & Terry, Inc.

DENSOMETERS
W. & L. E. Gurley

DESIGN CONSTRUCTION
Ebasco Services

DETERGENTS
Calgon, Inc.
Cowles Chemical Co.
General Dyestuff Corp.
Monsanto Chemical Company
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp.

DEWAXING CHEMICALS
General Dyestuff Corp.
Nopco Chemical Co.

DIFFERENTIAL SCALES
Thwing-Albert Instrument Co.

DIGESTERS
Babcock & Wilcox Co.
Chicago Bridge & Iron Co.
Lukenweld
Pusey & Jones Corp.

DIRTEC
Bird Machine Co.

DISPERSING AGENTS
Calgon, Inc.
General Dyestuff Corp.
Monsanto Chemical Company
Nopco Chemical Co.
Rohm & Haas Co.

DOCTORS
Bird Machine Company
Downingtown Mfg. Co.
Lobdell Co.
Lodding Engineering Corp.
The Moore & White Co.
The Sandy Hill Iron & Brass Works

DOCTOR BLADES
Bird Machine Company
Lodding Engrg. Corp.
The Moore & White Co.
The Sandy Hill Iron & Brass Works

DRIERS
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Hardinge Company, Inc.
Lukenweld
The Moore & White Co.
Murray Mfg. Co., D. J.
J. J. Ross Company
Red-Ray Mfg. Co., Inc.
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.
The Youngstown Welding & Engrg. Co.

DRIVES
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Bird Machine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Fairbanks, Morse & Co.
Farrel-Birmingham Co.
General Electric Company
Gibbs-Brower Company, Inc.
Rodney Hunt Machine Co.
Link Belt Company
Moore & White Co.
Murray, D. J., Mfg. Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.
Westinghouse Electric Corp.

DRYER DRAINAGE
Stickle Steam Specialties Co.

DRYER ROLL PYROMETER
Thwing-Albert Instrument Co.

DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
Frank W. Egan & Co.
M. W. Jenkins Sons, Inc.
E. D. Jones & Son Co.
Moore & White Co.
D. J. Murray Mfg. Co.
John Waldron Corp.

DUSTING BRUSHES
M. W. Jenkins Sons, Inc.

DYESTUFFS
American Cyanamid Company, Calco Chemical Div.
Ciba Company
E. I. du Pont de Nemours & Co., Inc.
Geigy Co., The
General Dyestuffs Corp.
National Aniline Division, Allied Chemical & Dye Corp.

ELECTRIC HYGROMETER
Thwing-Albert Instrument Co.

EMBOSSING ROLLS
The Appleton Machine Co.
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Northern Engraving & Mch. Co.
B. F. Perkins & Son, Inc.
John Waldron Corp.

EMULSIFIERS
General Dyestuff Corp.
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp.

ENZYMES
Rohm & Haas Co.
Pillsbury Mills, Inc.
Vanderbilt Co., R. T.

EVAPORATORS
Davis Engrg. Corp.
Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J., Mfg. Co.
Swenson Evaporator Co., Div. of Whiting Corp.

EXPANDERS
Mount Hope Machinery Co.

FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.
Stephens-Adamson Mfg. Co.

FEEDERS
Hardinge Company, Inc.
Merrick Scale Mfg. Co.
Leeds & Northrup

FELTS
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Draper Bros. Corp.
Huyck & Son, F. C.
Lockport Felt Co.
Mt. Vernon-Woodbury Mills, Inc.
Morey Paper Mill Supply Co.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Waterbury Felt Co.
Waterbury, H., & Sons Co.
Williams-Gray Co.

FELT CLEANERS
Calgon, Inc.
Cowles Chemical Co.
General Dyestuff Corp.
Nopco Chemical Co.

FELT CONDITIONERS
Bird Machine Co.

FELT GUIDES
Frank W. Egan & Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Waldron Corp., John

FILLERS
American Cyanamid Company, Industrial Chemicals Division
A. M. Meincke & Son, Inc.
Vanderbilt Co., R. T.
Witco Chemical Co.

FILTERS
Bird Machine Company
Hardinge Company, Inc.
Hungerford & Terry, Inc.
Johnson Corp.
Moore & White Co.
J. O. Ross Engrg. Corp.
Witco Chemical Co.
Walworth Company

FITTINGS
Crane Company
The Kuhns Bros. Co.
Walworth Company

FLEXIBLE COUPLINGS
Ajax Flexible Coupling Co.
John Waldron Corp.

FLOORING, GRATING AND TREADS
The Goodyear Tire & Rubber Company
Norton Co.

FLOW BOXES, STAINLESS-CLAD
Lukens Steel Co.

FORK LIFT TRUCKS
Towmotor Corp.

FORMATION
Thwing-Albert Instrument Co.

FORMING MACHINES
Downingtown Mfg. Co.
The Moore & White Co.
Noble & Wood Machine Co.
Oliver United Filters, Inc.
The Sandy Hill Iron & Brass Works

FREENESS TESTERS
Testing Machines, Inc.

GASKETS
The Goodyear Tire & Rubber Company

GEARS
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Frank W. Egan & Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Link Belt Company
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Westinghouse Electric Corp.

GRINDERS
Carthage Machine Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Lobdell Co.
Norton Company
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
Norton Company

GUIDES, WEB
Askania Regulator Company
The Moore & White Co.
Mount Hope Machinery Co.
Bound Brook Engrg. Co.
John Waldron Corp.

GUMS
National Starch Products Inc.
Stein-Hall Co., Inc.

HEADS
Babcock & Wilcox Co.
Lukens Steel Company

HEAT EXCHANGERS AND RECOVERY SYSTEMS
Davis Engrg. Corp.
Stickle Steam Specialties Co.
Westinghouse Electric Corp.

HEATING, VENTILATING & AIR CONDITIONING
The Appleton Machine Co.
Armstrong Machine Works
Davis Engrg. Corp.
E. D. Jones & Sons Co.
General Electric Co.
Leeds & Northrup
Minneapolis-Honeywell Regulator Co.
D. J. Murray Mfg. Co.
Red-Ray Mfg. Co., Inc.
Ross Engineering Corp., J. O.
Stickle Steam Specialties Co.
Valley Iron Works Co.
Westinghouse Electric Corp.

HOSE (Air, Water, Suction, etc.)
The Goodyear Tire & Rubber Company

IMPREGNANTS
American Anode Div.

INDENTING MACHINES
Dilts Machine Works.

INDUSTRIAL TRACTORS
Towmotor Corp.

INKOMETER
Thwing-Albert Instrument Co.

INSTRUMENTS, TESTING AND MEASURING
Askania Regulator Company
Bauer Brothers Co.
N. P. Bowsher
The Bristol Company
The Brown Instrument Co.
E. J. Cady Company
Cochrane Corp.
General Electric Company
W. & L. E. Gurley
Leeds & Northrup Company
National Technical Laboratories
B. F. Perkins & Son
Photovolt Corp.
Taylor Instrument Cos.
Testing Machines, Inc.
Thwing-Albert Instrument Co.

JOINTS
Johnson Corp.
Perfecting Service Corp.

JORDAN FILLINGS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
E. D. Jones & Sons Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KNIVES
Dilts Machine Works, Inc.
Hamblet Machine Co.
Heppenstall Company
E. D. Jones & Sons Co.
The Moore & White Co.
Taylor Stiles & Co.
Valley Iron Works Co.

KNOT BORING MACHINES
DeZurik Shower Company

LABORATORY CORRUGATOR
Thwing-Albert Instrument Co.

LABORATORY EQUIPMENT
Appleton Machine Co.
Bauer Brothers Co.
The Biggs Boiler Works Co.
Bird Machine Company
Dilts Machine Works
W. & L. E. Gurley
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories

"K" CAST-IRON FITTINGS GIVE YOU THE CRAFTSMANSHIP OF SPECIALISTS

"K" on a cast-iron fitting is the trademark of a company that has specialized on this class of product for more than sixty years. All of our efforts, skills, and facilities are devoted exclusively to the manufacture of cast-iron fittings which we guarantee to be sound and accurate in every respect.

A large proportion of the country's leading plant engineers and piping contractors have learned that it pays to use "K" Cast-Iron Fittings. This is evidenced by the growth of our business, which has required numerous plant expansions to keep a complete supply of "K" Fittings in stock for immediate shipment.

The "K" line consists of 3,000 sizes in the following types:

Standard and Extra Heavy Flanged Fittings
Standard and Extra Heavy Screwed Fittings
Drainage and Sprinkler Fittings
Standard and Extra Heavy Companion Flanges

We have a handy pocket gage for measuring pipe sizes. It contains a table of theoretical allowances for make-up when pipe is forcibly screwed into fittings. If you want one, mail a request on your letterhead.

PRECISION FITTINGS

THE KUHNS BROTHERS CO.
1804 McCALL AVENUE
DAYTON 1, OHIO

Combined Market Facilities with Malleable Iron Fittings Co., Branford, Conn.

CHAS. T. MAIN, INC.
CONSULTING ENGINEERS
Process Studies, Design, Specifications and Engineering Supervision
PULP AND PAPER MILLS
Steam, Hydraulic and Electrical Engineering
Reports, Consultation and Valuations
80 Federal Street — Boston 10, Mass.

HARDY S. FERGUSON & CO.
Consulting Engineers
200 FIFTH AVENUE, NEW YORK 10, N. Y.
Consultation, Reports, Valuation and Designs
for the Construction and Equipment of
Steam and Hydro-Electric Power Plants
Dams and Other Hydraulic Structures
Pulp and Paper Mills

Geigy
DYESTUFF MAKERS SINCE 1859
Presented in U. S. and Canada by
GEIGY COMPANY, INC.
89-91 Barclay Street, New York 8, N. Y.
Branches: BOSTON • CHARLOTTE, N. C. • CHICAGO • LOS ANGELES
PHILADELPHIA • PORTLAND, ORE. • PROVIDENCE • TORONTO

INTERNATIONAL WIRE WORKS
Fourdrinier Wires
MENASHA, WISCONSIN

DEINKING — DECOLORIZING
COOKING PROCESSES
K-121-B and K-140
ENGINEERING
THE KINSLEY CHEMICAL COMPANY
4838 WEST 130th STREET — CLEVELAND 11, OHIO

Only seven parts make up the
SIER-BATH GEAR COUPLING

- *Easy to install or dismantle*
- *No special tools needed*
- *Compact*
- *Lubricated*

Send for catalog # 6

FRANK W. EGAN & CO.
BOUND BROOK, N. J.
Builders of Paper Converting Machinery

WHERE TO BUY

Taylor Instrument Companies
Testing Machines, Inc.
Valley Iron Works Co.

LAMINATING COMPOUNDS
National Wax Co.

LAY BOYS
Gibbs-Brower Company, Inc.
Hamblet Machine Co.
Moore & White Co.

LUBRICANTS
Sinclair Refining Co.
Socony-Vacuum Oil Co.
Sun Oil Company
The Texas Company
Tide Water Associated Oil Co.

MATERIALS HANDLING
Cleveland Crane & Engrg. Co.
Frank G. Hough Co.
Stephens-Adamson Mfg. Co.
The Wellman Engrg. Co.

MICRO-CRYSTALLINE WAXES
National Wax Co.

MICROMETERS & CALIPERS
Farrel-Birmingham Co.
Lobdell Co.
Testing Machines, Inc.

MOISTURE CONTENT CONTROL
Stickle Steam Specialties Co.

MOTORS AND GENERATORS
Allis-Chalmers Mfg. Co.
Fairbanks, Morse & Co.
General Electric Company
Reliance Electric & Engrg. Co.
Westinghouse Electric Corp.

NICKEL AND NICKEL ALLOYS
The International Nickel Co.

NOZZLES
Link Belt Company

PACKING BOXES
Johnson Corporation
The Moore & White Co.
Perfecting Service Corp.

PAPER MACHINES
Bagley & Sewall Co.
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Lukenweld
Moore & White Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.

PAPER MACHINE SLICES
E. D. Jones & Sons Co.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

PAPER TUBE MACHINERY
Dietz Machine Works
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hudson Sharp Machine Co.
Langston Co., Samuel M.

PARAFFIN WAXES
National Wax Co.

PASTING MACHINES
Dilts Machine Wks.
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
Waldron Corp., John

PERFORATED METAL
Allis-Chalmers Mfg. Co.

PETROLATUMS
National Wax Co.

pH METERS
Thwing-Albert Instrument Co.

PIGMENTS
Ferro Enamel Corp.

PIPE
American Cast Iron Pipe Co.
Armco Drainage & Metal Products, Inc.
Babcock & Wilcox Co.
Crane Company
Michigan Pipe Co.
Michigan Steel Casting Co.
National Tube Co.
Walworth Company
Youngstown Welding & Engrg. Co.

PIPE FITTINGS
American Cast Iron Pipe Co.
The American Rolling Mill Co.
Crane Company
Michigan Steel Casting Co.
Walworth Co.

PIPE MARKERS
W. H. Brady Co.

PITCH CONTROL
General Dyestuff Corp.
Monsanto Chemical Company
Rohm & Haas Co.

PLATERS
Gibbs-Brower Company, Inc.
Perkins & Son, Inc., B. F.

PLATES
Armco Steel Corp.
Babcock & Wilcox Co.
The Biggs Boiler Works Co.
J. O. Ross Engrg. Corp.
Lukenweld Division
Lukens Steel Company
Timken Roller Bearing Co.

PLUGS
The Appleton Machine Co.
E. D. Jones & Sons Co.

PRECISION SAMPLE CUTTER
Testing Machines, Inc
Thwing-Albert Instrument Co.

PRESERVATIVES
E. I. du Pont de Nemours & Co.
General Dyestuff Corp.

PRESSURE VESSELS, STEEL AND ALLOY
Babcock & Wilcox Co.
Chicago Bridge & Iron Co.

PRESSES
Dietz Machine Works
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
The Moore & White Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Valley Iron Works Co.
Waldron Corp., John
H. G. Weber & Co., Inc.
Williams Apparatus Co.

PULP CLASSIFIER
The Bauer Bros. Co.
Thwing-Albert Instrument Co.

PULP STOCK VALVES
Crane Company
Record Fdy. & Mach. Co.

PULPERS
American Paper Machy. & Engrg. Works, Inc.
Bauer Brothers Co.
Dilts Machine Works
E. D. Jones & Sons Co.

PULPS
Brown Company
Gottesman & Co., Inc.
Kho Hansson, Inc.
Lyddon & Co. (America), Inc.
Parsons & Whittemore, Inc.

Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.
Pulp Sales Corp.

PULPSTONES

Norton Company

PUMPS

American Paper Machy. & Engrg. Works, Inc.
Allis-Chalmers Mfg. Co.
Buffalo Pumps, Inc.
Byron Jackson Co.
DeLaval Steam Turbine Co.
Dorr Company
Downingtown Mfg. Co.
Fairbanks, Morse & Co.
Gibbs-Brower Company, Inc.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Roots Connersville Blower Corp.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Warren Steam Pump Company

RADIANT BURNERS

Red-Ray Mfg. Co., Inc.

RAG COOKING PROCESSES

The Kinsley Chemical Company
General Dyestuff Corp.
Rohm & Haas Co.

RAG CUTTERS

Gibbs-Brower Company, Inc.
B. F. Perkins & Son, Inc.
Taylor-Stiles & Co.

RECAUSTICIZING PLANTS

The Dorr Company

RECOVERY SYSTEMS

Babcock & Wilcox Co.
Bulkley, Dunton Pulp Co., Inc.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones Corp.
Ross Engineering Corp., J. O.
Valley Iron Works Co.

REELS

The Appleton Machine Co.
Downingtown Mfg. Co.
Hudson Sharp Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
The Smith & Winchester Mfg. Co.

REFINERS

Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Gibbs-Brower Company, Inc.
E. D. Jones & Sons Co.
Morden Machines Co.
Murray, D. J., Mfg. Co.
Sandy Hill Iron & Brass Works
Sutherland Refiner Corp.
Valley Iron Works

REGULATORS

American Paper Machy. & Engrg. Works, Inc.
Allis-Chalmers Mfg. Co.
Armstrong Machine Works
Bird Machine Company
The Bristol Company
DeZurik Shower Company
General Electric Co.
Johnson Corp.
Leeds & Northrup Company
Minneapolis-Honeywell Regulator Co.
National Technical Laboratories
Stickle Steam Specialties Co.
Taylor Instrument Companies
Wallace & Tiernan
Westinghouse Electric Corp.

RESINS

American Cyanamid Company, Industrial Chemicals Division
The Dow Chemical Company
The Goodyear Tire & Rubber Company
Hercules Powder Co.
Monsanto Chemical Company
Rohm & Haas Co., Resinous Products Div.

ROLLS

American Cast Iron Pipe Co.
Appleton Machine Co.
Downingtown Mfg. Co.
Frank W. Egan & Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Lobdell Co.
Edward J. McBride & Co.
The Moore & White Co.
D. J. Murray Mfg. Co.
Perkins, B. F., & Sons Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Co.
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
U. S. Rubber Co.
Valley Iron Works Co.
Waldron Corp., John
The Youngstown Welding & Engrg. Co.

ROLL COVERS

The Cincinnati Rubber Mfg. Co.
The Goodyear Tire & Rubber Company
Edward J. McBride & Co.
Stowe-Woodward, Inc.

ROLL STANDS

Cameron Machine Co.
Frank W. Egan & Co.
Moore & White Co.
Potdevin Machine Co.
John Waldron Corp.
H. G. Weber & Co., Inc.

ROPE CARRIERS

The Moore & White Co.

ROTARY BOILERS

The Biggs Boiler Works Co.

ROTARY STEAM JOINTS

Johnson Corp.
The Moore & White Co.
Perfecting Service Corp.

RUBBER PRODUCTS

The Goodyear Tire & Rubber Company

SATURANTS

American Anode Div.

SATURATING MACHINES

Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Moore & White Co.
Noble & Wood Machine Co.
Potdevin Machine Co.
Waldron Corp., John
Weber, Herman G.

SAVEALLS

Bird Machine Company
Chicago Bridge & Iron Co.
Hardinge Company

SCALES

Fairbanks, Morse & Co.
Merrick Scale Mfg. Co.
Testing Machines, Inc.

SCREEN PLATES

Bird Machine Company
Fitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Testing Machines, Inc.

SCREENS

Allis-Chalmers Mfg. Co.
Appleton Wire Works
Appleton Machine Company
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
E. D. Jones & Sons Co.
Link Belt Company
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Stephens-Adamson Mfg. Co.
Valley Iron Works Co.

SHEET MACHINES

Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Valley Iron Works Co.

SHOWER PIPES

Bird Machine Company
DeZurik Shower Company
Downingtown Mfg. Co.
Moore & White Co.
Sandusky Fdy. & Mch. Co.
Smith & Winchester Mfg. Co.

SHREDDERS

Bauer Brothers Co.
Carthage Machine Co.
Gibbs-Brower Company, Inc.

SIZING

American Cyanamid Company, Industrial Chemicals Division
The Dow Chemical Company
du Pont, E. I., de Nemours & Co.
Hercules Powder Co.
The Hubinger Co.
Monsanto Chemical Company
National Aluminate Corp.
Stein-Hall Co., Inc.

SIZING TESTER

W. & L. E. Gurley
Testing Machines, Inc.
Thwing-Albert Instrument Co.

SLIME CONTROL

The Dow Chemical Company
E. I. du Pont de Nemours & Co.
General Dyestuff Corp.
Monsanto Chemical Co.
National Aluminate Corp.
Rohm & Haas Co.
Vanderbilt Co., R. T.

SLITTERS

Cameron Machine Co.
Carthage Machine Co.
Dietz Machine Works
Dilts Machine Works
Downingtown Mfg. Co.
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson Sharp Machine Co.
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Potdevin Machine Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

SMOKE STACKS

The Biggs Boiler Works Co.
Chicago Bridge & Iron Co.

SPLICING TISSUE

Williams-Gray Co.

SOFTNESS-STIFFNESS TESTER

W. & L. E. Gurley
Testing Machines, Inc.
Thwing-Albert Instrument Co.

SOLUBLE OILS

American Cyanamid Company, Industrial Chemicals Division
General Dyestuff Corp.
Nopco Chemical Co.

STAINLESS STEEL

American Cast Iron Pipe Co.
Armco Steel Corp.
Michigan Steel Casting Co
U. S. Steel Corp.

STARCH

American Cyanamid Company, Industrial Chemicals Division
A. M. Meincke & Son, Inc.
Clinton Foods, Inc.
The Hubinger Co.
National Starch Products Inc.
Stein-Hall Co., Inc.

STEAM JOINTS

The Moore & White Co.

STEAM SPECIALTIES

Babcock & Wilcox Co.
Combustion Engrg. Co., Inc.
Davis Engrg. Corp.
Johnson Corp.
Perfecting Service Corp.
Stickle Steam Specialties Co.

STEEL

Armco Steel Corp.
Carnegie Illinois Steel Co.
Lukens Steel Company
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
U. S. Steel Corp.

STEEL, CLAD

Babcock & Wilcox Co.
Lukens Steel Company

STEEL TANKS

The Biggs Boiler Works Co.
Chicago Bridge & Iron Co.

STRETCH TESTER

Thwing-Albert Instrument Co.

STUFF CHESTS

Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
Valley Iron Works Co.

SUCTION BOXES

Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works

SUCTION UNIT

Paper & Industrial Appliances, Inc.

SULPHUR

American Cyanamid Company, Industrial Chemicals Division
Texas Gulf Sulphur Co.
Witco Chemical Company

SULPHUR BURNERS

Valley Iron Works Co.

SULPHUR DIOXIDE

American Cyanamid Co., Calco Chemical Div.
Virginia Smelting Co.

SUPERCALENDERS

The Appleton Machine Co.
B. F. Perkins & Son, Inc.

SYNTHETIC LATICES

American Anode Div.
The Goodyear Tire & Rubber Company
Nopco Chemical Co.

TACHOMETERS

The Brown Instrument Co.
Westinghouse Electric Corp.

TALC

American Cyanamid Company Industrial Chemicals Division
Vanderbilt Co., R. T.

TANKS

The Biggs Boiler Works Co.
Chicago Bridge & Iron Co.
Kalamazoo Tank & Silo Co.
The Noble & Wood Machine Co.
B. F. Perkins & Sons, Inc.
J. O. Ross Engrg. Corp.
Waldron Corp., John

TEARING TESTERS

Testing Machines, Inc.
Thwing-Albert Instrument Co.

TENSILE TESTERS

B. F. Perkins & Son, Inc.
Testing Machines Inc.
Thwing-Albert Instrument Co.

WHERE TO BUY

THICKENERS, DECKERS AND SAVEALLS

The Appleton Machine Co.
Bird Machine Company
Bulkley, Dunton Pulp Co., Inc.
Carthage Machine Co.
Dilts Machine Works
Dorr Co.
Downingtown Mfg. Co.
Hardinge Co., Inc.
Moore & White Co.
D. J. Murray Mfg. Co.
Oliver United Filters, Inc.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Wks.
Valley Iron Works Co.

TITANIUM

American Cyanamid Co., Calco Chemical Div.
E. I. du Pont de Nemours & Co.
Titanium Pigment Co.
R. T. Vanderbilt Co.

TOOLS

Walworth Company

TRACTORS & TRUCKS

Towmotor Corp.

TRANSMISSIONS

Link Belt Company
Stephens-Adamson Mfg. Co.

TRAPS

Armstrong Machine Works
Crane Co.
Johnson Corporation
Shartle Bros. Mch. Co.
Stickle Steam Specialties Co.

TUBES

Babcock & Wilcox Co.
National Tube Co.

TUBING, MECHANICAL

National Tube Co.

TUBS

Rodney Hunt Machine Co.
Valley Iron Works Co.

TURBINES

Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Company
Hunt, Rodney, Mach. Co.
Westinghouse Electric Corp.

USED EQUIPMENT

Gibbs-Brower Co.
Thomas W. Hall Co.
J. J. Ross Company
Ross Paper Machy. Corp.

VALVES

The Bristol Company
The Brown Instrument Co.
Crane Company
E. D. Jones & Sons Co.
Magnus Metal Corp.
D. J. Murray Mfg. Co.
William Powell Co.
Record Fdy. & Mch. Co.
The Sandy Hill Iron & Brass Wks.
Stickle Steam Specialties Co.
Taylor Instrument Companies
Trimbey Mach. Wks.
Valley Iron Works Co.
Walworth Company

WASHERS

Bird Machine Company
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
E. D. Jones & Sons Co.
Moore & White Co.
Oliver United Filters
The Sandy Hill Iron & Brass Wks.
Rodney Hunt Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

WASTE TREATING EQUIPMENT

The Dorr Company
Hungerford & Terry, Inc.

WATER CONDITIONING

Calgon, Inc.
General Dyestuff Corp.
Hungerford & Terry, Inc.
National Aluminate Corp.

WATER DISPERSIONS

American Anode, Inc.
Rohm & Haas Co., Resinous Products Div.

WATER PENETRATION TESTER

Thwing-Albert Instrument Co.

WATER SOFTENERS

Hungerford & Terry, Inc.

WATER VAPOR CUPS

Thwing-Albert Instrument Co.

WAXES

National Wax Company

WAXING MACHINERY

Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
The Mayer Machine Co.
Potdevin Machine Co.
Waldron Corp., John
Weber, Herman G.

WELDING EQUIPMENT

General Electric Company
Walworth Company
Westinghouse Electric Co.

WET MACHINES

Carthage Machine Co.
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Moore & White Co.
Pusey & Jones Company
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

WETTING AGENTS

American Cyanamid Company, Industrial Chemicals Division
General Dyestuff Corp.
Monsanto Chemical Company
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp.

WHITE WATER HEATERS, AUTOMATIC SELF CLEANING TYPE

Davis Engineering Corp.

WHITE WATER TREATING EQUIPT.

Hungerford & Terry, Inc.

WINDERS AND REWINDERS

The Appleton Machine Co.
Cameron Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hudson-Sharp Mach. Co.
Langston Co., Samuel M.
Moore & White Co.
Paper Converting Mch. Co.
Potdevin Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Waldron Corp., John

WIRE BRUSHES

M. W. Jenkins Sons Inc.

WIRES

Appleton Wire Works
International Wire Works
Lindsay Wire Weaving Co.
Williams-Gray Co.

WIRE BRUSHES

Williams-Gray Co.

WOOD SPLITTERS

The Appleton Machine Co.
Carthage Machine Co.

ADVERTISERS

IN THIS ISSUE

A

Allis-Chalmers Mfg. Co. 3
Amercoat Corp. 48
American Leather Belting Assn. 39
Appleton Woolen Mills, Inc. .. 56

C

Classified Advertising 49
Corn Products Sales Co. 53
Cowles Chemical Co. 27

D

Downingtown Mfg. Co. 2
Dow Chemical Co. 32
Durirron Company 10

E

Egan & Co., Frank W. 56

F

Ferguson Co., H. K. 41
Ferguson, Hardy S., & Co. ... 56

G

Geigy Company 56
General Electric Co. ..... 8 & 9
Gibbs-Brower Co., Inc. 50
Goodyear Tire & Rubber Co. Back Cover
Gotteman & Co. ..... Front Cover

H

Hall, Thomas W., Co. 50
Hooker Electrochemical Co. 59
Hungerford & Terry, Inc. .. 54

I

International Nickel Co. 6
International Wire Works 56

J

Jeffrey Mfg. Co. 29

K

Kinsley Chemical Co. 56
Kuhns Bros. Co. 55

L

Lindsay Wire Weaving Co. 52

M

Main, Inc., Charles T. 56
Michigan Steel Casting Co. 51

P

Price & Pierce, Ltd. 52

R

Raymond Service, Charles L. .. 49
Roots Connersville Blower Corp. 47

T

Texas Co., The 4

U

U. S. Steel Corp. 13

W

Westinghouse Electric Corp. .14 & 15
West Virginia Pulp & Paper Co. 54

HUGHES PRINTING CO.
EAST STROUDSBURG, PA.

Liquid Chlorine Versus Bleaching Powder

ALTHOUGH bleaching powder was in regular use by pulp and paper makers for many years, it carried with it time consuming and costly difficulties. Bleaching powder was never stable in storage and when made into bleach liquor, it was difficult to get clear solutions and to eliminate sludge.

When liquid chlorine became readily and cheaply available, the old bleach powder methods could be discarded. Under the stimulus of production for World War I, electrolytic cell design improved, chlorine production increased and economical methods of liquifying and transporting were developed. Hooker engineers and chemists played an important part in this progress. They also helped specifically in the pulp and paper industry not only in improving bleaching techniques but in the designing of bleaching equipment.

Hooker technicians are constantly engaged in making available for you the high purity liquid chlorine and other Hooker chemicals you use. The results of their studies, too, are available in Hooker Technical Bulletins and cover a wide range of subjects of interest to pulp and paper makers. A list of the titles of these bulletins and copies of those you would like to have will be sent to you when requested on your letterhead.

HOOKER ELECTROCHEMICAL COMPANY
6 UNION STREET, NIAGARA FALLS, N. Y.
New York, N.Y. Wilmington, Calif. Tacoma, Wash.

HOOKER CHEMICALS

From the salt of the earth

2800 **Caustic Soda Muriatic Acid Sodium Sulfide Paradichlorbenzene Chlorine Sodium Sulfhydrate**

Specify PLIOWELD

for permanent anti-corrosion protection

TYPICAL USES OF PLIOWELD

- Processing Tanks — *rectangular, round, square*
- Tank Covers—*flat, box, radius types*
- Storage Tanks—*open top, flat or dished heads*
- Truck Tanks
- Railroad Tank Cars
- Fans—wheels and housings
- Flanged Pipe
- Flanged Pipe Fittings
- Ductwork
- Scrubbers—air purifiers
- Agitators
- Continuous Vacuum Filters
- Troughs and Chutes
- Pumps
- Filter Frames
- Moisture Eliminators
- Miscellaneous Fabricated Items

Plioweld can also be used to combat abrasion

WHEREVER metal is used to store, process or transport corrosive chemicals — solutions of inorganic acids, salts and alkalis; metal plating solutions; organic materials — it can be *permanently protected* with PLIOWELD rubber lining.

Every PLIOWELD installation is especially formulated after careful analysis of the specific operation by the G.T.M.—Goodyear Technical Man. To consult him on *your* problems, get in touch with your nearest Goodyear Industrial Rubber Products Distributor, or write Goodyear, Akron 16, Ohio.

Plioweld—T.M. The Goodyear Tire & Rubber Company

7 REASONS WHY THE G.T.M. SPECIFIES PLIOWELD

1. Effectively seals in corrosives that cannot be handled in metal
2. Bonds permanently to metal surfaces — an exclusive Goodyear process
3. Does not split or loosen with vibration or severe external impacts
4. Does not crack or buckle under alternate wetting and drying or under temperature changes
5. Surface will not disintegrate or slough off
6. Protects chemicals from discoloration, iron "pickup" and other contaminations
7. Each installation specially formulated to provide maximum protection against chemical handled

We think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network

GOODYEAR

THE GREATEST NAME IN RUBBER